

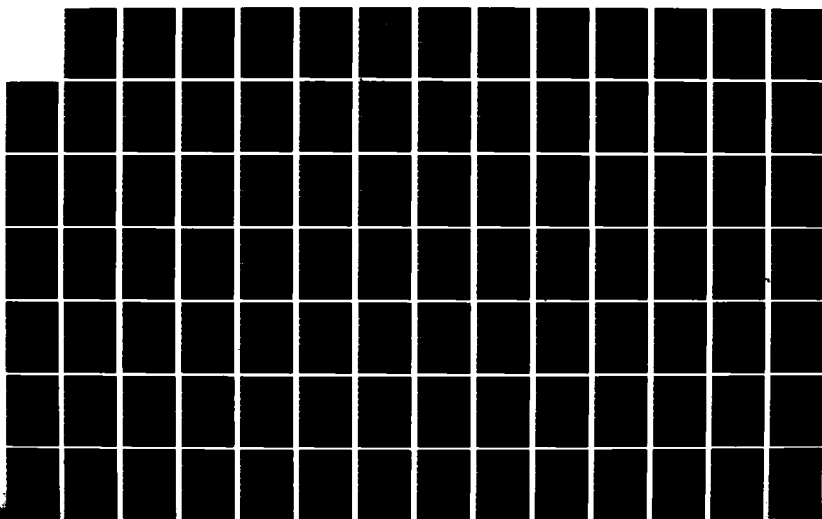
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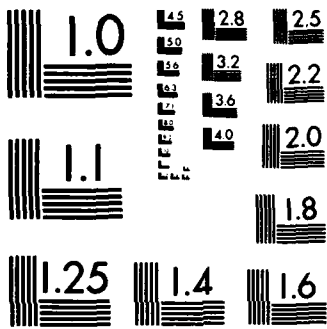
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Q-GERT MODEL OF THE CONTRACTING CYCLE

Christopher D. Miller, GS-12

LSSR 118-83

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To improve the efficiency of a Government contracting organization, a manager must predict the consequences of decision alternatives. There are so many variables (workload, resources, experience levels, changing procedures) that predicting, or even measuring, the effect of various decision alternatives is very difficult. The research objective was to construct and test a Q-GERT model of the contracting cycle of an Air Force research and development contracting organization. Data was collected on the contracting procedures used. Twenty-eight contract networks were developed, from the administrative notice to the ten million dollar competitive contract. Each network was divided into many small tasks. Experienced buying personnel provided estimates of a range of time to complete each task. The result was that the model successfully imitated the contracting cycle time from receipt of the purchase request to the contract award. A manager can use the model to test the effect of changes in resources or procedures on the contracting cycle time. The model should be a valuable management tool.

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Q-GERT MODEL OF THE CONTRACTING CYCLE

A THESIS

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Logistics Management

By

Christopher D. Miller, AB

September 1983

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This thesis, written by

Mr. Christopher D. Miller

has been accepted by the undersigned on behalf of the
faculty of the School of Systems and Logistics in partial
fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN LOGISTICS MANAGEMENT
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CHAPTER I

INTRODUCTION

One important aspect of a manager's job is to make decisions on the use of human, financial, and material resources (19:1). In order to make good decisions, a manager tries to forecast the effect of any decision he makes. He compares alternatives. For example, if an employee leaves the organization, the manager must decide whether to replace the individual. The manager tries to forecast the cost of hiring and training a replacement against the cost of redistributing the work among the remaining employees. The redistributed work may overburden the remaining employees and quality may suffer. A decision like this one is difficult to make in an organization which has clear goals (such as increasing profits). Decisions are even more difficult in organizations with varied goals (7:40).

A manager in a government purchasing organization has many objectives. Some of the more important objectives are:

1. to buy the right item at the right price with the right delivery date,
2. to remedy social and economic problems by requiring Government contractors to comply with contract provisions such as the Davis-Bacon Act, the Buy American Act, and the

Service Contract Act,

3. to comply with rigid budgetary restrictions and public audit procedures,
4. to conduct business in full view of the public,
5. to comply with detailed purchasing procedures,
6. to avoid censure by the public and the press,
7. to prevent fraud, waste and abuse,
8. to operate efficiently, and
9. to operate effectively.

Many of these objectives are conflicting. To prevent non-compliance with laws and procedures, and to show full disclosure to the public, extensive documentation is required. This slows down the contracting process and increases costs. Management tries to balance efficiency and the public's right to know (18:1-9).

The Government shares in the problems of all non-profit institutions. Anthony and Herzlinger (7:40-41) recognize five major problems which arise from the lack of a profit measure in the non-profit organization:

1. No Single Criterion. A non-profit organization has multiple objectives which make the comparison of alternative courses of action difficult, which greatly complicates decision-making.

2. Difficulty in Relating Costs and Benefits. What is

the dollar value of contract documentation? The cost of preventing overpayments for spare parts may be higher than the overpayments, but a Government manager may choose to prevent the overpayments because of fear of public censure. The cost of public censure is hard to quantify.

3. Difficulty in Measuring Performance. The principal goal of a non-profit organization is to render service. The measure of the benefit of that service is much less precise than the profit-making organization's measure of benefit.

4. Centralization of Decisions. An organization with many goals and vague measures of performance cannot delegate important decisions to lower-level managers. The paperwork which must be provided to the top decision-makers in order for them to make decisions, and in transmitting those decisions to the lower levels, is substantial.

5. Difficulty in Comparing Organizations. Profit is the measure of the success of most profit-making firms. Non-profit organizations must use a more subjective measurement. To measure efficiency, non-profit organizations often compare inputs (dollars or people), rather than outputs, because the inputs are easier to measure.

Problem Statement

Because non-profit organizations lack one overriding, easily measured objective, decision-making is very dif-

ficult. The effects of alternative decisions are difficult to predict given the complexity, the detailed procedures, and the many objectives of the non-profit organization. The manager in a non-profit institution needs a method or tool to aid him in predicting the effects of change to his organization.

Justification For Research

An example of a complex, multi-goaled, non-profit organization is the Directorate of Research and Development (R&D) Contracting, Aeronautical Systems Division (ASD), Air Force Systems Command (AFSC), located at Wright-Patterson Air Force Base, Ohio. The mission of R&D Contracting is to procure, administer and manage contracts for research and development, support services, and specialized equipment for AFSC Laboratories at WPAFB, the Aerospace Medical Division, the Air Force Human Resources Laboratory, ASD and other activities as directed by ASD (5:124). Figure 1 is an organizational chart showing R&D Contracting under the Deputy of Contracting & Manufacturing for ASD.

Many changes have been introduced recently to the contracting procedures in R&D Contracting to improve the contracting process: (1) a new solicitation package, (2) Fast Track contracting procedures, (3) Short Form Research contracting procedures, (4) Four-Step procurement proce-

dures, and (5) Draft Request for Proposal procedures. This is not a complete list, but is representative of management's desire to simplify and reduce the contracting cycle.

The purpose of the new solicitation package is to reduce solicitation preparation time. The package was developed and administered by the quality circle in R&D Contracting. Despite the grassroots source of this change, many contracting personnel resisted the new procedures. Because the new procedures were just being tested, the old procedures were still in effect on many solicitations. The conflicting solicitation procedures upset many people, and may explain why the new package may be abandoned at the end of FY83 (34).

Fast Track contracting procedures were inaugurated by AFSC in September 1981. The purpose of Fast Track is to reduce the contracting cycle by reducing the number of contracting procedures. Standard buys with few problems are singled-out for Fast Track procedures. These standard buys are given priority status and rushed through the contracting cycle (32:1). Unfortunately, the procedures which AFSC reduced were not required in R&D Contracting. If there is any saving to the contract cycle, it is from giving these low-dollar, simple buys priority-handling (31).

Short Form Research contracting procedures are for use

with non-profit organizations who submit unsolicited proposals. Contracts for the purchase of a unsolicited proposal from a non-profit institution can be accomplished with a one-page, one-signature document. If the submitter of the proposal follows the correct procedures, the contracting cycle can be reduced considerably, but the procedure has a very limited application (20).

Four-Step procurement procedures separate the time of receipt of an offeror's technical proposal from the receipt of the cost proposal. The Government is permitted to negotiate with only the apparent winner, instead of being required to negotiate with every offeror within the competitive range. This procedure was used only once in R&D Contracting, because these procedures lengthen the contracting cycle (31).

The Draft Request for Proposal (DRFP) procedure was created by AFSC. The purpose of the procedure is to reduce the contracting cycle by giving the potential offerors an opportunity to review the solicitation package before it is formally released. The offerors are expected to suggest improvements to clarify the solicitation, which would lead to better proposals, and shorten negotiations. Because of the expected benefits, the DRFP was made mandatory on all R&D solicitations for one year. Instead of reducing the contracting cycle, the DRFP increased it. The buyers had to

process DRFP's in addition to their normal duties. The offerors usually failed to suggest any improvements to the package, and most offerors already received advanced notice of the Government's solicitation through other means. The DRFP is rarely used today (16).

The projected costs and benefits of many of these changes proved to be inexact. But even when a change appears to be beneficial, the full cost of the change may be hidden from the decision-maker. For example, if a procedure is fragmented into many different procedures, the worker has less opportunity to perform each procedure. The opportunity for learning the procedure well to perform the procedure quickly is reduced (14:132). The manager should weigh the inefficiency of numerous procedures against the benefit of more applicable procedures.

Research Objective

The objective of this thesis is to develop a computer model of R&D Contracting to aid the manager in making decisions which effect the contracting cycle. The model was tested for accuracy, then changes were introduced in the model to determine their effects and to demonstrate the value of the model.

Research Questions

The simulation model was used to answer the following

questions:

1. With a specified workload, what is the optimum ratio of buyers-to-clerk?

2. With a specified number of buyers, what is the optimum level of work for the Procuring Contracting Officer (PCO)?

3. As the amount of workload increases, at what point does the contracting cycle increase significantly?

4. If certain administrative reviews were reduced or eliminated, how much shorter would the contracting cycle be?

The purpose of solving these research questions is to demonstrate the potential usefulness of a simulation model to the managers of contracting organizations.

Sources of Data

There are many Government organizations in the Dayton area which would be as convenient to study, but the R&D Contracting Directorate at ASD is most appropriate for a number of reasons. First, they have demonstrated a willingness to apply student research to their operation. An Air Force Institute of Technology thesis (13) is the basis of the work measurement system which is in effect today in R&D Contracting (25). A second reason is because the directorate is process-oriented. The management in R&D

Contracting is concerned with the process of awarding contracts. Thousands of different programs go through the same procedures in this directorate, and an improvement in the process may have a lasting effect on the contracting cycle. In most of ASD, the contracting groups are project-oriented. Contracting procedures are tailored for each project. An improvement in contracting procedures in a Systems Program Office (SPO) may not have as big of an effect as a change in procedures in R&D Contracting.

R&D Contracting has been in the forefront of applying computerization to the management process (25). Modeling is another step in using computers to improve the organization. Computer simulation may be unknown in R&D Contracting, but using the computers as an aid to management is very common.

Another reason for selecting R&D Contracting is the researcher's familiarity with it (six years of experience), its sponsorship of his schooling, and his personal interest in improving the contracting process there. As will be shown later, a detailed knowledge of the practical side of the contracting process was essential in the development of the computer model.

R&D Organization

The R&D Contracting Directorate writes contracts for concept exploration, exploratory development, advance deve-

development, and manufacturing technology. The size of the contracts range from less than \$10,000 to over \$80 million. The directorate supports five main laboratories and several small ones (16).

The four buying divisions of the directorate each support a major laboratory. Each division has two or three branches, that support a specific laboratory or portion of a laboratory (see Figure 1). The directorate also has its own pricing division, contract review committee, small business office, and management operations division. A total of 162 personnel are authorized, including 24 military (4:135).

The function of the directorate is to solicit, negotiate, award, and administer development contracts. The individual buyer has more control over his contracts than the typical buyer in a SPO; the R&D buyer writes the solicitation, usually performs the pricing, negotiates the contract, writes the contract, and administers it until final delivery. The predominant contract type is Cost-Plus-Fixed-Fee (CPFF), although Cost Reimbursement, Cost-Sharing, Time-and-Materials, Fixed Price Level-of-Effort, and Firm Fixed Price contracts are common. Each buyer is expected to be able to select and write any type of contract at any dollar level. Extensive training and high quality personnel are required (12).

Assumptions and Limitations of the Research

1. The model only applies to R&D Contracting. The procedures in other buying organizations may be different. A model of another organization could be made following the same methods used in this study.

2. Procedures change, so the model will become increasingly inaccurate in time, unless the model is updated.

3. The model does not forecast the quality of contractual actions. The model could be used to predict the reduction in the contracting cycle which would occur if certain administrative reviews were eliminated, but the model will not predict the reduction in quality. A manager would be required to forecast the change in quality and determine whether the reduction in the contracting cycle outweighed the reduction in quality.

4. The model is imprecise (29:13). Any model incorporates only some of the many variables which impact the output (in this case, the output is contracting cycle time). Some of the variables which were not incorporated in the model are:

(a) Trainees were not included. The buyers, clerks, and the PCO in the model are all journeymen. With additional research into how trainees differ from journeymen in their time to perform the contractual actions, the model could incorporate trainees, too.

(b) Contract types (fixed price, time-and-materials, etc.) are not differentiated in the model. The contracting cycle might be longer or shorter with different contract types.

(c) Buying personnel may work faster when work is heavy, or when work must be completed by a specific date. The model does not incorporate this feature.

Definitions of Key Terms

Network map: R&D Contracting's management information system (DATA-CEN) recognizes thirty-four different contract types, such as F1 - fundings or C2 - Competitive Contract \$ 10,000 to \$ 100,000. The model includes twenty-eight of the thirty-four contract types, called networks. A network is a list of tasks which must be performed in chronological order to process a Purchase Request (PR) into a contractual action (contract award or contract modification). Each network includes the service time for each task. The network map is the listing of the networks in the Fortran subroutine of the model. Every PR in the model will follow a path through the network map to be processed into a contractual action.

Service Time: The time associated with the work that a server performs on a PR, the activity duration, is the service time. Service time does not include waiting time (the

time that a PR waits to be served) (22:19).

Contracting Cycle: The length of time which a PR is in the contracting process, from the receipt of the PR in R&D Contracting to the mailing of the contractual document is the contracting cycle. The contracting cycle is measured in hours in the model.

Queue: The queue is the line in which a PR waits until a server (buyer, clerk, or PCO) can begin working on the PR. If there are many PR's waiting for service, then the queue is long. The waiting time is called 'queuing time'.

Purchase Request (PR): A purchase request is a manually prepared form (AFLC/AFSC Form 36) to request central procurement action on requirements for material and services (28:562). The PR authorizes the contracting organization to begin the contracting process.

Buyer: The buyer protects the Government's interests in all contracting matters. The principle duties are: solicitation, pricing, source selection, contract writing, contract documentation, and contract administration. The buyer must adhere to all acquisition regulations, policies and procedures. The buyer is not permitted to sign a contract as an agent for the Government, unless he is also a contracting officer. The branch chief is the direct supervisor of both the buyer and the contracting officer. The journeyman buyer is grade GS-12. Trainee buyers start at

grade GS-5. The buyer's official title is Contract Specialist (2).

Clerk: The clerk assists the PCO and the buyer in soliciting, awarding, and administering contracts. The clerk must be a qualified typist. Major duties include drafting and typing of solicitation and contract documents, and formatting documents and correspondence going to higher echelons. The official title of the clerk is Procurement Clerk (Typing). The journeyman level is grade GS-5. Trainee clerks start at grade GS-3 (3).

Procuring Contracting Officer (PCO): The PCO provides direction, guidance, and on-the-job training for the buyers. The PCO has review and approval responsibilities over work generated by the buyers. The PCO is the official contracting agent of the Government. In R&D Contracting most PCO's also act as buyers, but in the model these two roles are separated. When the PCO in the model acts as a buyer, he is Buyer-D. The official title of the PCO in R&D Contracting is Contract Negotiator. The grades for PCO's are GS-12 and GS-13.(1).

Summary

This study was designed to develop a model of the contracting cycle in R&D Contracting. An accurate model would provide management with a tool to predict the effect

of change on the contracting cycle. Chapter II is a review of related research and theory on the management tools which are used to project or measure change in the Department of Defense (DoD) contracting organizations. A discussion of modeling and its uses as a management tool, and a review of the methods for collecting data for the model are also included. Chapter III incorporates a description of the contracting cycle in R&D Contracting and its imitation in the model. The experimental design is presented. Chapter IV reviews the results of the experimentation with the model and offers an interpretation of the results. Chapter V summarizes the study and discusses findings, draws conclusions, and recommends topics for future research.

CHAPTER II

BACKGROUND

This chapter explores three issues: (1) how managers measure the effect of change in Government contracting organizations, (2) what modeling is, and its benefits, and (3) how data should be collected for the model.

Measuring Change in Government Contracting

In order to make effective decisions, managers need accurate and timely information on their organizations (6:659). A management information system and data base are essential to measurement systems (19:330). A management information system is any system designed to collect, organize, process, and analyze data to provide the manager with information to make decisions (6:659). Work measurement is a key requirement; without it, a manager cannot know how efficient or effective the organization is. Department of Defense (DoD) contracting managers have measured effectiveness and efficiency in three ways: (1) time standards, (2) indices, and (3) trend data (8:9).

Time Standards

Time standards, or productivity standards, are pre-established time intervals in which a specific task should be accomplished (8:12). A clearly related concept from

industry is the work standard. A work standard is defined as the time required by a qualified worker performing at a normal rate of speed, and experiencing normal fatigue and delays, to produce one unit of output (11:7). Standards can be used for projecting the delivery date for the customer. They can also be used as a benchmark to judge a worker's efficiency. The manager uses standards for forecasting and planning, and to compare one organization with another (9:7).

Work measurement systems based on Frederick Taylor's scientific management techniques were used by the Army's Rock Island Arsenal and by the Navy's shipyards in Boston and Mare Island in the early 1900's (35:19). The use of standards in DoD contracting dates back to 1965 with the advent of the Defense Integrated Management Engineering System (8:13).

Hanscom Air Force Base has used procurement standards extensively. Separate standards were developed for each grade level of contracting personnel; higher paid personnel were expected to perform more work. Each employee's performance rating was largely based on a combination of the number of documents processed and the dollar value of the documents processed (8:20).

The Air Force Logistics Command at Warner-Robins Air Logistics Center developed the E-841 system of performance

standards with three goals: (1) to forecast personnel requirements based on workload fluctuations, and policy or procedural changes, (2) to provide a data base for evaluation of buying personnel, and (3) to provide a simple management tool (8:20).

Each contractual action was broken down into two components, variable and constant. The constant component consists of tasks which are always required for a specific type of contractual action. The variable component is composed of up to 53 different tasks which may be required on a specific contractual action. The applicable standards for the additional tasks are added to the constant component standard and a composite standard is developed for each contractual action (8:21). In implementing this system, some organizations require the buyers to log all their activities as they perform them in order to produce an accurate composite standard for each action.

Standards have proven very useful in high volume, repetitive activities. Labor performance standards have been used within DoD in manpower determinations, workloading and scheduling, cost estimating, budgeting, and in evaluating labor performance. Productivity improvements as high as thirty percent have been recorded in DoD (21:37).

Indices

The second measurement tool is the index. Indices

measure the change which has occurred to a specified variable over time (17:586). Indices are commonly used to compare the efficiency of an organization, or the efficiency of individuals in the organization. Indices must be compared over time to determine the effect of change. Managers try to find cause-and-effect relationships in indices. The major use of indices in DoD contracting are for pricing efficiency, labor efficiency, and performance efficiency (8:32).

Pricing efficiency is used to determine the effectiveness of the contract negotiator. Two pricing efficiency formulas are:

- (1)
$$\frac{\text{Offeror's Proposed Cost} - \text{Negotiated Price}}{\text{Offeror's Proposed Cost} - \text{Air Force Objective}} = \text{Pricing Efficiency}$$
- (2)
$$\frac{\text{Historical Unit Cost}}{\text{Negotiated Unit Cost}} = \text{Pricing Efficiency}$$

A second use for indices in DoD contracting is for determining labor efficiency. Organizations with labor standards can compare actual hours to standard hours earned to determine labor efficiency. In evaluating the productivity of the organization, the total time spent on training, staff meetings, and leave is compared to the labor hours spent on the primary mission (8:35). These two formulas are:

$$(1) \quad \frac{\text{Actual Hours Expended}}{\text{Standard Hours Earned}} = \text{Labor Efficiency}$$

$$(2) \quad \frac{\text{Indirect Hours}}{\text{Direct Hours}} = \text{Labor Efficiency}$$

The third common use for indices in DoD contracting is for measuring performance efficiency. Outputs of the organization are compared to inputs. Typical performance efficiency indices are cost-per-contracting action, and cost-per-contracting-dollar. The cost-per-contracting-action is appropriate to organizations with a stable workload. The cost-per-contracting-dollar is more appropriate to organizations with flexible workloads or a wide range of complexity in contractual actions (8:37).

Productivity Trends

The last major measurement technique used in DoD contracting is productivity trends. Productivity trends compare the present with the past to predict the future. It is a time series that describes the long-term movement of productivity. For example, if productivity has an upward trend, then productivity is increasing, but not necessarily in each time period. Trends dampen the effect of seasonality and cycles (17:597). DoD Instruction 5010.34 states that productivity trend data is important in budgeting, manpower planning, and operational management (10:3 of Encl.3).

Trends give the contracting manager an historical perspective on the efficiency of the organization.

Background Factors

When using standards, indices, and trends, DoD contracting managers must consider the following factors (34:18):

1. the education and skill of the labor force,
2. the level of technology available, including automation,
3. the extent of capital investment by the organization,
4. the resourcefulness and enterprise of the managers and workers,
5. the perceptions of the workforce,
6. the tenure of key personnel, and
7. environmental factors (social, psychological, and cultural influences on the organization).

If any of these factors change significantly, the output of the organization could change.

Workload must be analyzed to determine its effect on output. A change in workload can hide the effects of a change to the organization. The number of overaged contracts and contracting actions is a good indication of workload (8:61).

The experience level of personnel sometimes changes. Automation often changes the ratio of professionals to non-professionals in the organization. An increasing ratio of military-to-civilian personnel may indicate a reduction in experienced personnel (8:62). An uneven workload may distort the output in the organization. A manager must consider all these factors when evaluating the effect of change in the organization.

Decision-making in R&D Contracting

R&D Contracting has been using scientific management to improve productivity for a long time. This organization had a work measurement system as early as 1960. This system was automated in the late 1960's, and extensively improved since then (13:25).

The management information system, DATA-CEN, provides managers and buyers with many reports without requiring extensive data input. Some of the major reports are:

1. a weekly performance report generated at the directorate, division, branch, and buyer levels. This report contains a listing of:
 - a. purchase requests accepted by month,
 - b. contract awards by month,
 - c. standard versus actual output by month,

- d. . current work by contract type,
 - e. current workload,
 - f. forecasted workload by month,
- 2. a monthly report of delinquent contracts, and
 - 3. a report on the status of each active PR, whenever the status of the PR is affected (25).

DATA-CEN keeps a running total of measurement points accumulated by each buyer and PCO, so individual productivity can be assessed. A forecast for the completion of the current work by buyer is reported each week. The DATA-CEN system is a time standard system. Today, there are standards for thirty-four types of contractual actions. These standards were developed in a 1974 Air Force Institute of Technology thesis (13). The researcher of the thesis surveyed most of the buyers in R&D Contracting. Each buyer surveyed was asked to provide average time estimates for each of 370 different activities which make-up the buyer's job. From these estimates, time standards were developed for each of the contract networks. These standards were later added to the management information system, so that the amount of work completed could be measured.

Shortcomings of Work Measurement Systems

Work measurement is an attempt to summarize and quantify work. It is necessarily a simplification of reality, so

inaccuracies are bound to occur. In addition to this basic problem with all work measurement systems, there are major problems with all the work measurement systems surveyed.

Time standards work better in high volume organizations than in organizations with one-of-a-kind actions (21:37). Time standards would be more appropriate to base contracting than to R&D Contracting, but time standards would be more appropriate to R&D Contracting than to contracting in a SPO.

The cost of administering a time standard system may outweigh the benefit of such a system. One implementation of time standards required 4800 engineered standards. Such a system requires extensive computer services and maintenance service (to run the system and update the standards), and places a heavy clerical workload on the workers whose work is measured (35:40).

Problems with indices and trend analysis stem from changes in the baselines and the definitions of inputs and outputs. For indices and trend analysis to function properly, changes to the system must be kept to a minimum. Since most contracting organizations operate in a dynamic environment, the managers who use these techniques may be ignoring this basic requirement (35:19)

In R&D Contracting, the DATA-CEN system lacks complexity factors; all actions of a network are projected to take the same standard amount of time. Standards cannot be custo-

mized for each PR. The system partially compensates for this by the proliferation of network types (thirty-four), and by permitting delay factors to be added to the standard time when appropriate (25).

Another feature that DATA-CEN lacks, is the ability to adjust the standard and forecasted completion dates for workload (25). The system forecasts that a PR will spend the standard amount of time to process through the contracting cycle whether the organization has no work-in-process, or is three months behind schedule. If the personnel in the contracting organization have no other work, then a PR will never have to wait in anyone's in-basket; the PR will receive service immediately. The PR should be processed in less than the standard time. Conversely, if the organization is overworked, the PR will encounter situations where it is waiting days for a server to finish other work before the PR can be processed.

The cost of work-in-process has been overlooked by the work measurement tools. William Sandman, consultant on productivity, states that no one has been considering the cost of work-in-process. He calculates that most work sits in queues for eighty percent of its time in the shop (27:8). Excess work-in-process increases the completion time for most work. Sandman believes that there is an optimum quantity of work-in-process (27:9). Less than the optimum redu-

ces productivity through worker idleness. Too much work-in-process increases leadtimes and decreases productivity. In industry, excess work-in-process is excess inventory, so reducing work-in-process saves money. In R&D Contracting, reducing work-in-process would reduce queueing time which would reduce the contract cycle.

By disregarding the effect of workload on the contracting cycle, a manager could easily misinterpret the effect of a change to the system. An improvement to the system could go unrecognized if workload increased. A new inefficiency could go unnoticed if workload decreased.

Simulation: A Potential Solution

Scientific management has been used in the manufacturing sector for years to increase productivity. The increases in the productivity of manufacturing and agriculture have outgained the increase in the productivity of the service industry. From 1950 to 1970, productivity growth in the service sector was 1% lower than the national average (13:1). Increasing productivity is easier in manufacturing than in the service sector. With physical, repetitive tasks, small reductions in the work process create big savings. These reductions are the result of work measurement methods; work is divided into small tasks which are analyzed and simplified. But work measurement methods have

been less successful with mental tasks, so service organizations (like the Government) have been less productive than manufacturing firms (11:330).

Recently, scientific management has developed techniques to help managers improve their organizations. Organizational behaviorists have studied organizations in an attempt to improve communications and motivation. Computer science has automated many of the service activities. Operational researchers have applied queueing theory to determine the optimum number of tellers in banks and cashiers in stores. Service organizations have learned to enlist their customers to increase productivity. Salad bars in restaurants, direct-dial long distance telephone calls, and electronic bank tellers are all examples of this (15:81).

The science of systems analysis was developed to help managers study and understand the ramifications of changes to their organizations (29:1). The systems analysis technique which is particularly useful in comparing alternatives is simulation. Simulation is the process of designing and conducting experiments with a model of the real system (29:2). The purpose of the model is to draw conclusions about real situations by analyzing the model (6:7).

With the advent of the digital computer and high level simulation languages, it is possible for a manager to use a computer simulation to determine the likely effect of change

on his organization. The manager can test many alternatives on a model and chose the one with the best outcome. Another benefit of this tool is that a model will provide the manager with the ability to test previously 'unthinkable' changes. A manager could determine the effect on output from forming a word-processing pool, without risking the animosity of the secretaries. One could determine the effect of reduced inspection on output without shipping any untested items.

Modeling may provide the manager with a better picture of the results of a change than reality would. When the effect of change cannot be determined within a short period after the introduction of the change, other variables may obscure the results of the change. For example, the quality circle of R&D Contracting introduced a procedure to reduce the solicitation preparation time. The new procedure was tested for one year (FY83). Then the effect of the new procedure on the contracting cycle was assessed. Workload in FY83 increased significantly over the workload in FY82. Many workers in R&D Contracting retired, or left the organization during the year. Unlike a scientific experiment, the quality circle was unable to control all the variables, so drawing conclusions about the effect of the new solicitation procedure has proven to be difficult (34).

The new solicitation procedure could have been run on a model of the organization; all other variables could have

been controlled. If the model revealed that the new procedure had no effect on the contracting cycle, then the one year experiment could have been avoided. If the procedure made a significant reduction in the contracting cycle on the model, management might have instituted the new procedures and avoided the confusion that a one-year test entails. Success on the model might have lowered the resistance of the contracting personnel to the new procedure, which could improve the effect of the change. The model could be used today to predict the effect that the old procedure would have had on the contracting cycle in FY83 (the new procedure test period).

Background of Modeling

There are five major functions that modeling fulfils:

1. an aid to thought,
2. an aid to communication,
3. for training and instructing,
4. a prediction tool,
5. an aid to experimentation (29:5).

Modeling is used in business, economics, marketing, education, politics, social science, behavioral science, international relations, transportation, manpower, law enforcement, urban studies, global systems, and many other areas (29:3).

Modeling in physical science can be very precise; the models are often based on scientific fact and theoretical laws. In fact, mathematics is a subset of modeling. But modeling is more of an art than a science for the industrial engineers, managers, and operations researchers, who deal with procedural systems. Procedural systems have few fundamental laws and are difficult to describe and represent. Policy is hard to quantify. There are considerable random components, and human decision-making is basic to the system. Procedural systems can be improved through procedural changes or design changes regarding scheduling, sequencing, distribution, allocation, or layout (22:1).

A computer language was developed over a ten year period by Purdue professor A. B. Pritsker to model procedural systems. The name of the language is Q-GERT, which is an acronym for Graphical Evaluation and Review Technique with Queuing. Q-GERT is based on Program Evaluation and Review Techniques (PERT), but augments PERT with queuing and decision-making (22:vii).

Q-GERT models have been developed for various applications:

1. claims processing in an insurance company,
2. production lines,
3. planning for contract negotiations,
4. research and development planning (22:5).

In the first application, the model was used to predict the processing time of various types of claims in a large office. The following procedural changes were investigated:

1. Changes in the volume of each type of work handled by the regional service office;
2. Changes in the composition and requirements of the work input;
3. Changes in priority rules for the processing of work in the same operating unit;
4. Changes in the pathways of the work flow system;
5. Reallocation of personnel among the different departments; and
6. Changes in total processing times of customer requests due to training programs in specific areas (22:7).

This application is very similar to the application in R&D Contracting, and confirms the appropriateness of the Q-GERT simulation language as the vehicle for a model of the contracting process.

Applicable Data Collection Methods

To construct a simulation model which accurately imitates the contracting cycle times in R&D Contracting, the tasks which are involved in transforming a PR into a contract award must be defined. After the tasks are defined, the service time for performing each task must be ascertained. The service times are of critical importance; if they are not accurate, the model will not imitate the system.

There are a number of methods to determine service

times. These methods are classed as work measurement techniques. Work measurement is a means of establishing an equitable relationship between the number of hours worked and the amount of work produced (11:7).

Historical Records

Historical records are the simplest type of work measurement. Output is correlated with labor hours. In procurement, contract line items awarded are frequently correlated with the number of employees in the organization. One year is compared to the last to determine productivity gains. For example, if 10,000 line items are awarded in 1980 with an organization of 100 people, and 10,800 line items are awarded in 1981 with an organization of 104 people, then these two years are compared as follows:

$$\text{Lines Awarded/Employees} = 10000/\overset{1980}{100} = 100 \quad 10800/\overset{1981}{104} = 103.8$$

So productivity increased by 3.8%.

The advantages of the historical records technique are:

1. It is easy to install and maintain.
2. It is simple to understand.
3. It can be used and maintained at a minimum cost.
4. It can provide information relatively rapidly.
5. It can be used in a small office performing varied functions, or it can be used in a large office performing only a single function (10:66).

Unfortunately, this technique has disadvantages:

1. Standards set by this technique automatically include all the inefficiencies of the past.
2. Standards set this way lack an absolute measure of effectiveness; consequently, it is impossible to compare performance between work centers.
3. It is impossible to change the standards when changes in operating methods or procedures are made.
4. The standards are only approximations and cannot be used where precision is required - for example, in the case of incentive wages (10:66).

Batching

A second measurement technique is batching; a technique of assigning an amount of work which is pre-measured to each employee. The size of the batch is changed until the batch can be performed by most employees in one hour. This becomes the standard for the job.

The advantages are that an employee's performance can be measured against the standard at any time, and the standard can be used for production scheduling.

The disadvantages are that unless the premeasured work is very uniform, the standards will not be precise. This technique cannot be used when there are many different jobs that each employee performs (10:67).

Self-Logging

A third measurement technique is self-logging or the diary method. Self-logging requires that the employee maintain a record of what jobs he has performed, how long each job took to complete, and how many items he produced in a specified period. This technique requires the employee to

keep records from one week to several months. The advantages are:

1. It is easy to install.
2. It is simple to understand.
3. It does not require elaborate training for usage.
4. It can be used to measure small work centers or isolated jobs that do not justify the use of more expensive or elaborate methods of measurement (10:68).

The disadvantages are that self-logging measures the actual time to perform a job, not the time that should be spent on the job. This technique depends on the cooperation of the people being measured. If they are careless or antithetical to the study, they can sabotage the results. Maintaining the log is fairly time-consuming; analyzing the logs takes longer. Precise standards cannot be set by this method (10:68).

Work Sampling

A fourth technique is work sampling. This technique requires that an observer record what workers are doing at random periods of time during the day. When a predetermined number of observations are completed, statistical methods are used to set-up time standards (11:335). For example, if 100 of the 500 observations found employees performing a certain task, the study would conclude that employees spend 20% of their time performing that task.

The advantages of work sampling are:

1. It is a relatively inexpensive technique to use.

2. It produces quick results in some situations.
3. It does not interfere with the normal routine of a work center.
4. It is less tedious, from the analyst's standpoint, than other techniques.
5. It can be used without technical training.
6. It produces results that are known to be reliable and accurate.
7. It can be used on small work centers that do not warrant the use of more elaborate techniques (10:70).

The disadvantages of work sampling are that it measures actual time, not the time the work should take. Employees do not understand or trust the technique. If procedures change, then the study must be repeated (10:70).

Stopwatch Method

The stopwatch technique of work measurement is the best known. An observer or camera watches the employee's every move. Each job is broken down into elements which are timed by the observer. The observer chooses a worker of average or better performance and notes the intensity of his effort. If the employee is working harder than normal, the employee's output will be discounted in setting the standard. If he is lackadaisical in his work, the standard will be set higher than his actual output.

The advantages of the stopwatch technique are:

1. It provides a highly accurate measurement of time.
2. It is a fast method for developing standards.
3. It provides a good record of methods, procedures, and working conditions.
4. It is easy to explain to employees.
5. It can be used in situations requiring a very precise standard - for example, in the case of incentive wages (10:71).

Stopwatch methods have been successfully used in factories, but less successfully in offices, because:

1. The stopwatch creates a morale problem, because employees do not like to be observed and timed.
2. The stopwatch connotes 'efficiency' and 'control' to the office worker; consequently, resentment may build up when the stopwatch is introduced in an office situation.
3. The stopwatch is unsatisfactory for measuring long cycle activities or work that is varied in nature.
4. The stopwatch is a costly way to measure low volume operations (10:71).

Synthetic Time System

A fifth work measurement technique is the predetermined time or synthetic time system. A job is broken down into specific bodily motions. The time for each motion is taken from a predetermined time table developed by a firm's own time study data or from industry standards. The times for each motion are added up and a precise time standard for each job is developed. The advantages are:

1. Standards developed through this approach are more precise and more objective than those developed through other techniques.
2. When methods change, the standards can easily be revised without restudying the entire job.
3. Standards can be established relatively rapidly.
4. The technique has a high degree of acceptance among employees and supervisors.
5. Standards can be maintained at low cost.
6. Predetermined times permit evaluation of proposed method changes prior to installation.
7. An organization's own personnel can be trained to use predetermined times effectively (10:73).

The disadvantages are that a highly skilled analyst is

required to segment a job into body motions. This type of work measurement only applies to repetitive, physical work.

Critical Evaluation of Work Measurement Methods

The historical method is a likely candidate to use in gathering data for a computer simulation model. This would certainly be the cheapest method of gathering data. The computerized management information system (MIS) in R&D Contracting would readily provide the number of contracting actions and the completion time for each award. The problem is that the present MIS system does not breakdown the awards into the approximately 60 steps required by the simulation model. So the needed data is not available from present records. Historical data will be used to validate the model. The simulation model will provide estimated completion times which will be compared to the completion times shown in the historical records. The actual inputs (new starts, contract modifications, etc.) of previous years will be input into the model to test whether the model will accurately replicate the output of the past.

Batching may be an effective measurement technique for measuring individual productivity and for scheduling production, but it will not provide the information needed for the model. A typical contract takes 150 days, and the contracts are not uniform (there is a range of complexity from

buy-to-buy), so batching appears to be infeasible.

Initially, self-logging appears to be very feasible. The many different tasks require many observations. If fifty people would keep diaries for a few weeks, there would be thousands of observations. This method has several drawbacks. This technique requires the most cooperation of the employees being measured. There is a natural resistance to being measured by any technique. But a technique that demands your active cooperation may invite sabotage.

A second problem with self-logging is that the cooperation of management is essential. Management must be sold on the potential benefits of the computer simulation model, otherwise they would not approve the diary method of collecting data. To make the diary method acceptable, the data collection period must be relatively short (two-to-three weeks), and the forms must be simple to fill out. The question is whether enough data can be gathered in a short period to make this method statistically acceptable.

What is the probable sample size? Last year the R&D Contracting made the following awards:

<u>CONTRACT TYPES</u>	<u>NUMBER OF AWARDS</u>	
Competitive New Starts	349	
Sole Source New Starts	179	
Contract Modifications	1672	
Delivery Orders	315	
Fundings	1238	(25:13)

The simulation model breaks these five categories into

twenty-eight (28) groups based on dollar amounts (less than \$100,000, \$100,000 to \$250,000, etc.). Examining the worst case, Sole Source New Starts, the model breaks this group into eight categories. If the 179 Sole Source New Starts were divided evenly among the eight networks in the simulation model, then there would be 22 contracts in each group. Given the expected variance in the times to complete each activity (each contract type is composed of approximately 60 activities) it is unlikely that even twenty-two samples would be statistically significant. For example, if an activity takes an average of four hours to perform, and the variance is four hours, to achieve 90% confidence that the sample mean is within thirty (30) minutes of the population mean requires a sample of forty-three (43). Projected data collection period - 2 years.

Asking an employee to keep a diary for one or two years is likely to result in gross inaccuracies in the data because the employee's motivation to make accurate records will flag long before the end of the data collection period. The self-logging method appears to be infeasible in this instance.

Work sampling suffers from the same problems - insufficient sample size. A lone observer (this specific situation) is unlikely to be able to make more observations than fifty employees keeping diaries.

Using the work sampling technique in contracting presents several problems. The first problem is in limiting the number of work categories to a reasonable number. Work categories are the different tasks performed by contracting personnel. The process of contracting involves so many different work categories that an excessive period of time would be required to collect a statistically significant sample in each work category. To solve this problem, a few general categories could replace the many work categories. Unfortunately, a few general categories would not provide the task information required by the model. Even when work sampling has been performed using general activities, the observer has not been unobtrusive. Unlike many forms of physical work, an observer cannot readily decide what job an individual is performing. In the past, observers tried to solve this problem by attaching a list of job activities to each work station and asking the buyers to mark the correct activity at all times. Despite the fact that the contracting activities being measured were much simpler than the contracting activities in R&D contracting, the buyers were unable to fit many of their activities into the general headings. The observers were constantly being asked by individuals to help them classify the particular job that they were doing (25). Work sampling will not garner the required information.

A modified form of work sampling was considered, called the Adcock method of work measurement (26:32). It is a cross between self-logging and work sampling. The person being measured fills out a diary of what he is doing at the moment when a telephone pocket pager (beeper) goes off. The beeper goes off at random intervals, approximately twice an hour. The work measurer spends his time making different beepers beep at random intervals to collect random samples from many employees. The advantage of this method is that the employee defines what he is doing, rather than an observer possibly misinterpreting what the employee is doing, and the employee is not required to record everything he does (26:32). This method is recommended for measuring the work of managers, because managers do so many different things every hour. This method is less appropriate with buyers and clerks because they are likely to spend longer on each work activity. Filling out a diary twice-an-hour is likely to require more diary-writing than recording everything (self-logging), because many jobs take longer than thirty minutes. In short, work sampling is less preferable than self-logging, and infeasible in this instance.

The stopwatch technique does not appear to be a good technique for use in R&D Contracting. Many repetitions of the same activity by one worker is a rarity. It is also unsatisfactory because of the long cycle times, the variety of

contracting actions, and the uneconomical expense of measuring over one thousand activities.

A predetermined time system is not appropriate to non-physical work and there is no time study data or industry standards to construct synthetic times.

Since none of the work measurement techniques appear to be feasible in this case, a judgmental, or subjective technique must be used. A survey was used in 1974 to collect information needed by that study of R&D Contracting (13). The information gleaned from that survey is not sufficiently detailed for use on this simulation model.

Delphi Procedure

The Delphi procedure is considered to be useful in acquiring accurate data from a group of experts (29:88). A panel of experts is chosen, but the experts are interviewed individually. Each expert provides an estimate of the time to complete an activity. After the first round of interviews, the estimates are averaged and a second round of interviews take place. When an expert's estimate is beyond a range of the average (such as one standard deviation), he is asked to justify or revise his estimate. If the expert believes his estimate is correct, his justification for his estimate is communicated to all the participants, to permit them to revise their estimates. Revised estimates are received from everyone. If the data collector believes that

further consensus is likely, additional rounds of interviews are conducted.

The advantage of the Delphi method is that group opinion is not formed by only a few vocal or important people on the panel. When justifications for outlying estimates are circulated, the opinion-maker is not identified.

There are problems with the Delphi technique. The bandwagon effect may cause consensus instead of reasoned argument. But experiments have shown that the Delphi technique is more efficient than face-to-face confrontation, and the estimates improve with the number of participants (29:90).

Objective work measurement techniques would be preferred if the number of samples which could be taken were statistically significant. But given the many different work activities and the low volume of work in R&D Contracting, subjective techniques must be used. The Delphi technique appears to be useful, practical, and preferable to other subjective techniques, so it was used to collect the data for the model.

The Delphi technique had to be modified in this study, because of time constraints. The number of estimates which each expert was asked to make was substantial (see appendices F, H, and J). Providing a justification for each estimate would have overburdened the experts. Only one round of questioning was conducted. The researcher planned on con-

ducting a second round on major elements of the modeled networks which significantly departed from historical data. Because of the breadth of the study, the researcher was unable to conduct any subsequent rounds.

Summary

This chapter presented a review of work measurement systems used by DoD contracting organizations. Each system has problems which cause inaccuracies in results. One of the major inadequacies of these work measurement systems is that the effect of workload on the contracting cycle is ignored.

Modeling can be a solution to this problem, but modeling a contracting organization requires a large amount of information on the procedures, functions, and service times of the organization. Methods of collecting the information required for the model were also reviewed.

Chapter III explores in detail the collection of data, the construction of the model, and the plan for answering the research questions.

CHAPTER III

METHODOLOGY

This chapter is composed of three topics. The first topic is the construction of the model, which includes a description of the data that was required to build the model, how that data was collected, an example of the modeling of a typical contractual action, and a detailed description of the model. The second topic is the experimentation plan. This includes the validation of the model, the limitations of the model, and the experimental design for answering the research questions. The third topic is a description of the computer programs developed, and the method of running the model at Wright-Patterson Air Force Base.

Constructing the Model

Constructing the model is the most time-consuming phase of the research. The researcher must learn how the system to be modeled functions by observing and participating in the system (29:46). After this research period, relevant data required to imitate the system must be ascertained. The three major sets of data which were required for this effort are: (1) the arrival times (schedule) of incoming work to the system, (2) a detailed step-by-step description

(network map) of the contracting process, and (3) the service times (working times) associated with each contract activity.

Collecting Arrival Times

The DATA-CEN system has a record of the arrival time of each PR received in the R&D Contracting directorate for the last three years (25). A list of these arrival times was provided by the Operations Management Division of R&D Contracting. Because the DATA-CEN system was revised at the beginning of FY82, the data before that period could not be used. FY82 was the only full fiscal year of data which followed the new system, so the arrival of PR's in the model imitates the PR arrival of that year.

Constructing Network Maps

The network maps were constructed next. Experienced buyers, clerks, and PCO's in R&D Contracting provided the chronological ordering of detailed tasks which compose the contracting process. Each network of the network map was based on the more-general networks defined in the DATA-CEN system (23). Twenty-eight networks were constructed:

NAME OF NETWORK

DESCRIPTION

C2	Competitive contract between \$10,000 and \$100,000
C3	Competitive contract between \$100,000 and \$250,000
C4	Competitive contract between \$250,000 and \$500,000
C5	Competitive contract between \$500,000 and \$750,000
C6	Competitive contract between \$750,000 and \$1,000,000
C7	Competitive contract between \$1 and \$3.5 Million

C8 Competitive contract between \$3.5 and \$10 Million
 F2 Competitive Fast Track contract
 C9 Dual award (contract)
 S2 Sole source contract between \$10,000 and \$100,000
 S3 Sole source contract between \$100,000 and \$250,000
 S4 Sole source contract between \$250,000 and \$500,000
 S5 Sole source contract between \$500,000 and \$750,000
 S6 Sole source contract between \$750,000 and \$1,000,000
 S7 Sole source contract between \$1 and \$3.5 Million
 S8 Sole source contract between \$3.5 and 10 Million
 F3 Sole source Fast Track contract

 F1 Funding (modification)

 M2 Modification between \$10,000 and \$100,000
 M3 Modification between \$100,000 and \$250,000
 M4 Modification between \$250,000 and \$500,000
 M5 Modification between \$500,000 and \$750,000
 M6 Modification between \$750,000 and \$1,000,000
 M7 Modification between \$1 and 3.5 Million
 M8 Modification between \$3.5 and \$10 Million
 F4 Fast Track modification

 A1 Administrative notice (unilateral)

 M0 No cost modification (bilateral)

Collecting Service Times

Each of the twenty-eight networks was subdivided into three groups: (1) the work performed by the PCO, (2) the work performed by the clerk, and (3) the work performed by the buyer and others. Based on information provided by several experienced personnel in R&D Contracting, major activities of each element of each network were determined. A list of these activities was constructed for each group, for each network. Copies of these lists were distributed to five experienced buyers, five experienced clerks, and five experienced PCO's in R&D Contracting for additions, dele-

tions, or corrections (see Appendix L).

The lists were revised as a result of the comments received from the fifteen experienced personnel. The revised lists are in Appendices F, H, and J. These lists were used to collect the third major set of data required, the service times for each activity. Before the service times were collected, the number of different service times required by the model had to be reduced. If every activity was estimated, each estimator would develop over 1500 estimates. The number of work activities was reduced by eliminating duplicates. For example, in twenty of the twenty-eight networks, the buyer carries the contract file to an office in another building for their review of the contract. The estimate of the time to walk there and back was asked once and used in all twenty networks.

Certain major activities were always estimated in each network in which they occurred. The major activities were:

1. PCO review of the new PR.
2. buyer's solicitation preparation.
3. clerk's solicitation preparation.
4. buyer's review of typed solicitation.
5. PCO's review of solicitation.
6. buyer's pricing of offers.
7. buyer's negotiation with offerors.
8. buyer's write-up of the award.

9. clerk's contract preparation.
10. buyer's review of the typed award.
11. PCO's review of the award.

In addition to estimating jobs which they performed, the buyers were asked to estimate times for work which is performed by individuals and groups (such as the Judge Advocate General [JAG] or Committee), which are not fully modeled. These groups are not modeled with queues and servers. Their service times are a combination of queue and service times. The processing of a PR is usually delayed by these outside activities, so the buyer's estimates should be accurate.

Before starting the sampling process, the researcher should define the sources of the data in terms of universe and population from which the sample is to be drawn.

Universe

The universe of the sample is the 41,000 federal employees who compose the procurement occupations group (33:10-11).

Population

R&D Contracting is authorized over 100 procurement positions. The personnel range in grade level from the clerk trainee (GS-3) to the R&D Director (GS-15), the military rank spans from Airman to Lieutenant Colonel (4:1-4).

Sample

To select a sample to answer the questionnaire, a list of

all the personnel in the four buying divisions of R&D Contracting was obtained. The workforce was divided into four groups: (1) buyers, (2) clerks, (3) PCO's, and (4) others. New employees do not have the background of experience in R&D Contracting to make sound estimates, so clerks and PCO's with less than one year of experience in their jobs were eliminated from the sample. Because of the complexity of the job, buyers with less than two years of experience were eliminated from the sample. PCO's have several years of experience as buyers, so one year of PCO experience was acceptable.

The names of the buyers, clerks and PCO's who met the criteria were thrown in a hat and drawn at random without replacement until twelve PCO's, twenty-four buyers', and twelve clerks' names were chosen. Then extra names were drawn as substitutes.

Of the twelve PCO's, eleven agreed to complete the questionnaire. Several of the buyers and clerks were on leave, so the substitutes were used. All personnel in the sample were provided with instructions for completing the questionnaire. These guidelines are in Appendix E.

There were two different questionnaires for the buyers. The first surveyed the high-dollar networks (such as the C6, S7, or M8 network). The second surveyed the low-dollar networks. Each of the buyers selected was asked whether he/she

had experience with high-dollar contracts. If the buyer did not have high-dollar experience, they were given a low-dollar questionnaire. The low-dollar questionnaires were completely distributed by the time the sixteenth buyer was asked to participate. All buyers, both selected and not selected in the sample, were asked to complete the high-dollar questionnaire, if they had required experience. Many high-dollar questionnaires remained, so all the PCO's in R&D Contracting with the required experience, who were not already selected to answer the PCO questionnaires, were asked to answer the high-dollar buyer questionnaires. Altogether, ten high-dollar questionnaires were distributed.

The questionnaires for all three groups required six estimates for each activity (or task): (1) the normal or average time to complete the task, (2) the optimistic time or the time it would take to complete the task if there were few problems with the contracting action, (3) the pessimistic time or the time that it would take to complete a task if there were more problems than normal, (4) the percentage of the time that the normal situation occurs, (5) the percentage of the time that the optimistic situation occurs, and (6) the percentage of the time that the pessimistic situation occurs. The purpose of the last three estimates is to aid in determining the proper distribution type (normal, triangular, uniform, etc.).

All three groups were asked to estimate their nonworking time; the percentage of the day that they take breaks or socialize. They also provided estimates of the percentage of the day that is spent on non-DATA-CEN work; work that is not required in performing any of the twenty-eight networks.

The estimate questionnaire is very detailed, listing most of the activities that are usually performed. There is even a list of the non-DATA-CEN work. The concept of the detailed questionnaire is to ensure that the estimates were made on the same tasks. There are so many networks, that many elements of the job could be overlooked by the estimator. So the questionnaires both reminded the interviewees of most of the work involved in each task and focused their attention on making good estimates.

Modeling a Funding: An Example

To explain how the model imitates the contracting cycle in R&D Contracting, a funding modification will be traced through the contracting cycle. The funding network, F1, is the most popular contract type, accounting for twenty-five percent of the contracting actions in R&D Contracting (25). It is also one of the simplest networks with a short contracting cycle. First, the processing of a funding action will be examined, step-by-step, then the imitation by the model will be explained.

How Funding is Processed

The contracting cycle for awarding a funding is shown in Figure 2. The funding starts with Congress, but for our purposes the funding starts when a purchase request (PR) for the funded amount arrives in the R&D Directorate. The PR is entered into the computer system, mailed to the Division Chief, who passes it to the Branch Chief, who assigns it to the appropriate buyer.

The buyer reviews the PR to insure that it is correct and telephones the contractor asking him for a letter stating the amount of funds which are needed for the fiscal year. If there are any problems with the funding amount (with the contractor) or problems with the PR format, the buyer telephones the PR initiator (usually an engineer at a laboratory) to resolve the issue. If the problem is critical, the PR may be rejected and returned to the initiator (this rarely occurs). The buyer accepts the PR, fills out a computer input card, sends the original PR to accounting, attaches the PR to the applicable contract file, and gives the file to the procurement clerk (activity 1 on Figure 2). Fundings are so routine, that the buyer does not need to draft the funding modification for the clerk. The clerk drafts and types the funding document. The clerk also prepares the contract documentation, and returns the package to the buyer (activity 2).

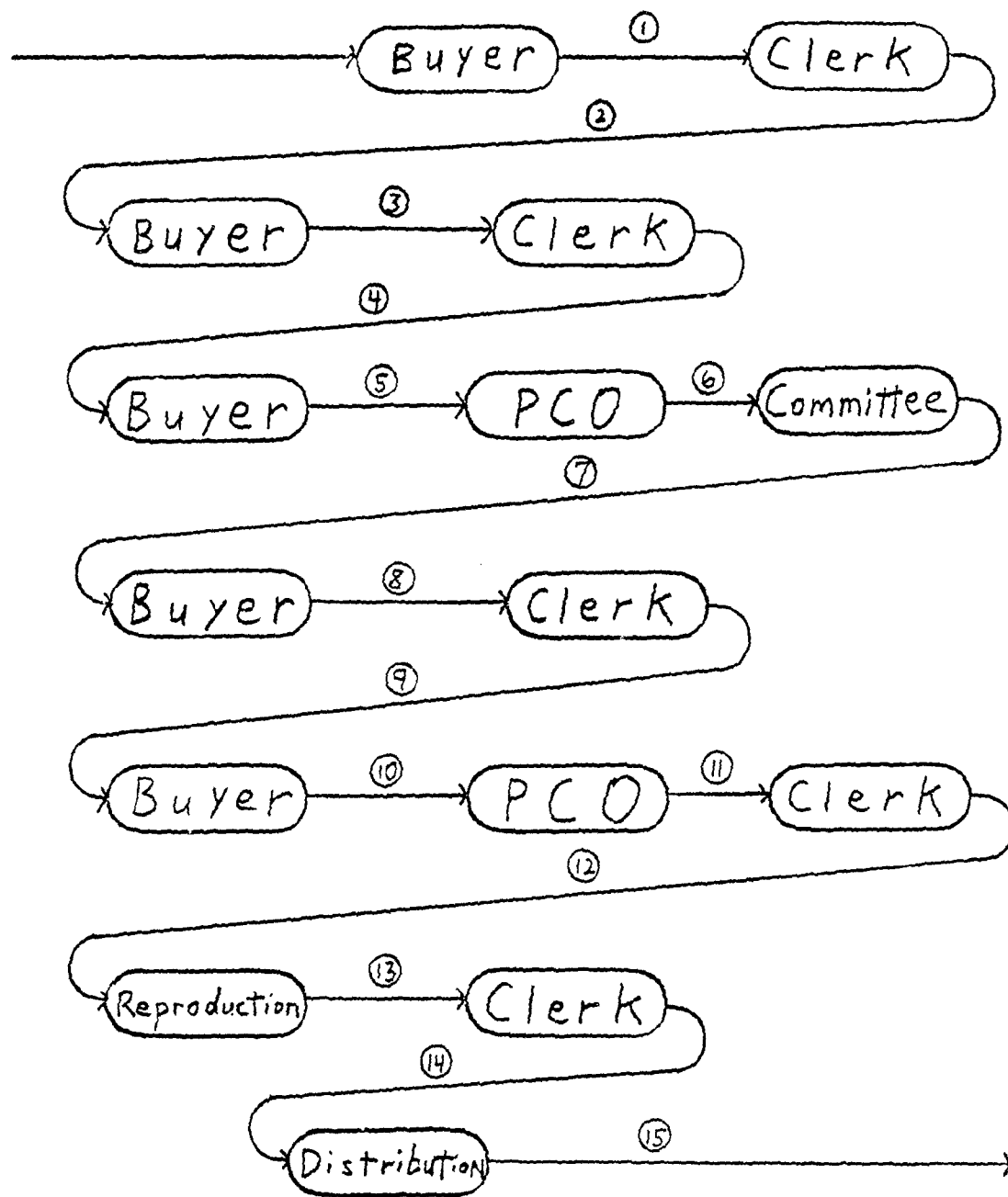


Figure 2
FUNDING PROCESS

The buyer reviews the file, usually makes a change, and returns it to the clerk (activity 3). The clerk types the change and gives it back to the buyer (activity 4). Accounting certifies the funds and returns the PR to the buyer. The contractor sends a letter agreeing to the funding. These are added to the contract file and given to the PCO for review (activity 5). The PCO reviews and sends the contract file to Committee (activity 6). They review the file and return it to the buyer directly, or indirectly through the Division Chief who may also perform a review (activity 7). The buyer answers Committee's comments and asks the clerk to type-up any changes (activity 8). The clerk types up the changes and returns the file to the buyer (activity 9). The buyer reviews (activity 10), and the PCO reviews and signs the funding modifications (activity 11). The clerk inputs the amendment into the computer and sends the amendment to reproduction (activity 12). Reproduction makes copies for all interested parties (activity 13). When the amendment returns, the clerk prepares copies of the supporting documentation and sends the package to distribution (activity 14). Distribution mails the funding modification to the contractor and distributes copies of the modification and supporting documentation to appropriate offices (activity 15), which ends the contracting cycle.

How Funding is Modeled

The model tries to imitate the contracting cycle, but the full model (Figure 3) does not resemble the contracting cycle of Figure 2. The oval shapes are nodes, and are numbered on the right inside corner. The funding cycle begins in Node 1 (it could also be started in Node 4, but this will be ignored for now, for simplicity). The lines which connect the nodes to each other are called branches. Branches represent service activities. The funding PR generated in Node 1 flows through the branch to Node 2, where it is assigned to a buyer. Assume that the PR is assigned to Buyer-A. The buyer's clerk is Clerk-A.

The PR flows to the traffic node (Node 3) where it is distributed to Buyer-A for service. Since nodes 1, 2, and 3 are administrative nodes (nodes for the convenience of the model), no time has accumulated on the total contracting cycle time of the funding PR. As the PR goes from Node 5 to Node 11, the time for the buyer to perform his activity (accepting the PR, calling the contractor, preparing the file, etc.) is recorded as the total contracting cycle time for the PR. At Node 11, the PR is directed to Node 37, Clerk-A. The PR flows through nodes 38 and 39 in no time. As the PR flows from Node 39 to Node 40, the time that the clerk spends preparing the contract modification and file is added to the total contracting cycle time. The PR flows

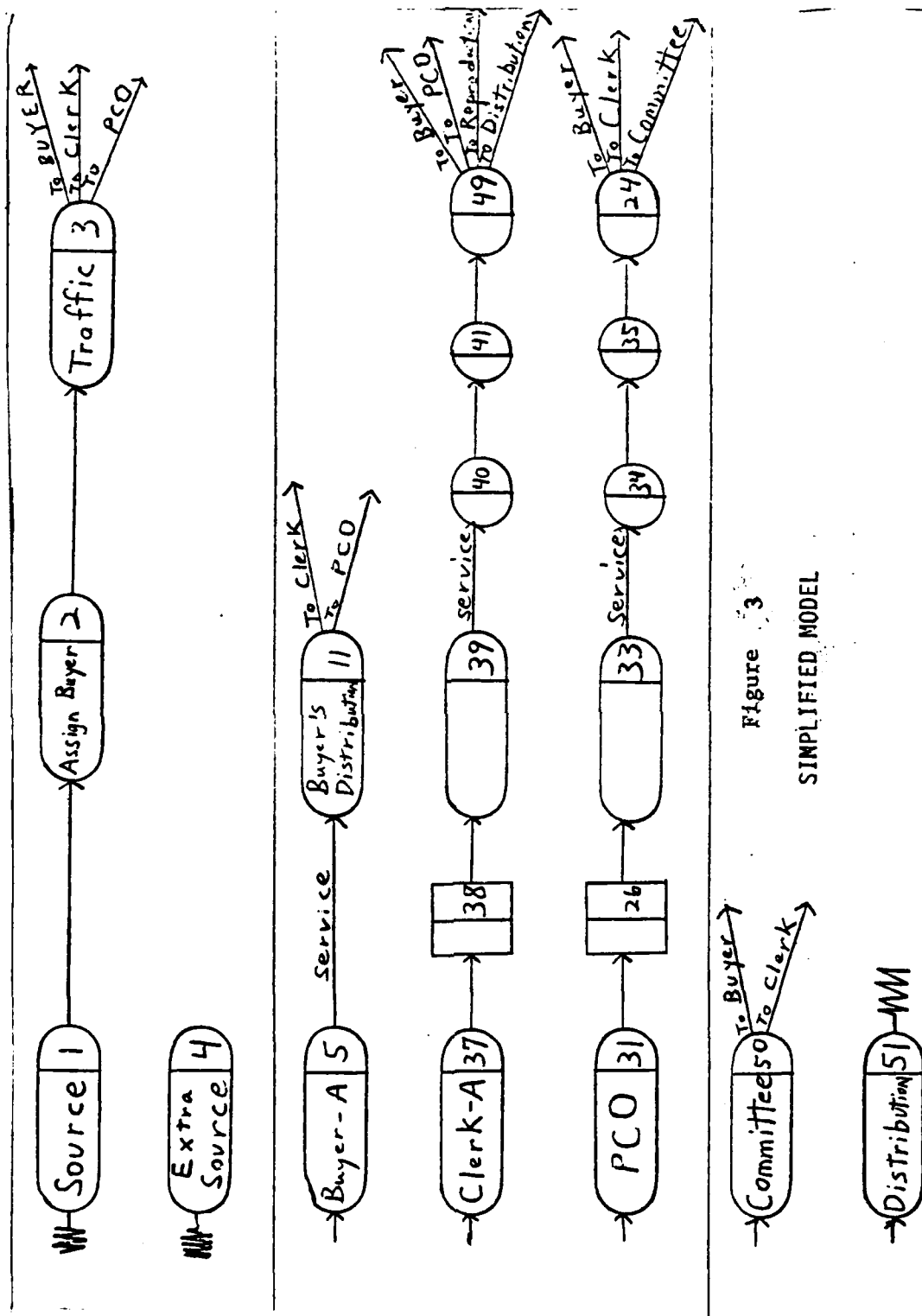


Figure 3
SIMPLIFIED MODEL

through nodes 40, 41, and 49, where it is distributed to Buyer-A. The time that Buyer-A spends reviewing the file is added to the total contracting time as the PR flows from Node 5 to Node 11. The PR is distributed at node 11 to Clerk-A. As the PR flows through the clerk's nodes again, the time that the clerk spends making the buyer-directed changes is added to the total contracting time of the PR. The PR is distributed back to the buyer, where the buyer's time in reviewing the changes is added to the total contracting cycle time. At Node 11, the PR is distributed to the PCO (Node 31). The PR flows through nodes 31, 26, 33, and 34. As the PR flows from Node 33 to Node 34, the time that the PCO spends reviewing the funding action is added to the total contracting cycle time. The PR flows through nodes 34, 35, and 24, where the PR is distributed to Committee (Node 50). As the PR flows from Node 24 to Node 50, the time that Committee spends reviewing the funding is added to the total contracting cycle time of the PR. From Node 50, the PR is returned to Node 5, Buyer-A. The time for the buyer to make Committee-directed changes is added to the running total of contracting cycle time as the PR flows from Node 5 to Node 11. From Node 11 the PR goes to Clerk-A who makes the Committee-directed corrections. The time for making corrections is added to the contracting cycle time. The PR flows back to Node 5, the buyer reviews

the corrections, the buyer's review time is recorded, and Node 11 distributes the PR to the PCO. The time that the PCO takes to review and sign the funding modification is recorded between Node 33 and Node 34. The PR is distributed from Node 24 to Node 37, Clerk-A. The clerk's time for preparing the file for reproduction is added to the contracting cycle time. At Node 49, the PR is distributed to Reproduction. On the way to Reproduction (Node 3 plays the part of reproduction), the amount of time that reproduction will take in performing the required work on this funding action will be added to the total contracting cycle time. The PR is distributed to Clerk-A, who prepares the document for distribution. Clerk-A's time is recorded. Node 49 distributes the PR to Node 51, Distribution. On the way, the time that Distribution spends performing their tasks for the PR are added to the total contracting cycle time of the PR. Node 51 is the last node for all PR's in the model. Node 51 records that total contracting cycle time for the PR and averages the cycle time with other funding PR's that have been processed through the model.

This example of how a PR flows through the model is a simplification of how the model functions. A more detailed description will be presented in the next section.

Q-GERT Model Description

The model was constructed to imitate the contracting cycle in the Flight Dynamics branch (PMRNA) of R&D Contracting. The model is composed of three buyers, two clerks, and a PCO, who also buys (the PCO's buying role is depicted as Buyer-D). The Flight Dynamics branch is composed of more buying personnel than are depicted in the model, but the model has the basic components of the branch, except for the branch chief. Conclusions that can be drawn from experimentation with the model should be directly applicable to the branch. With a little modification, the model could depict any buying branch in R&D Contracting.

The model is composed of the following components: (1) the arrival routine, (2) the traffic node and sink node, (3) the distribution nodes, and (4) the servers (buyers, clerks, and PCO). Each component will be discussed separately.

Arrival Routine

Figure 4 depicts the section of the model classed as the arrival routine. Nodes 1, 4, and 6 are all source nodes. Source nodes generate PR's. Node 1 generates PR's of all twenty-eight network types. When a PR leaves the right side of Node 1, it creates another PR which is depicted as the curved line which arcs back to the left side of Node 1. This curved line, like all solid lines outside of nodes, represents activities. The basic function of the model is

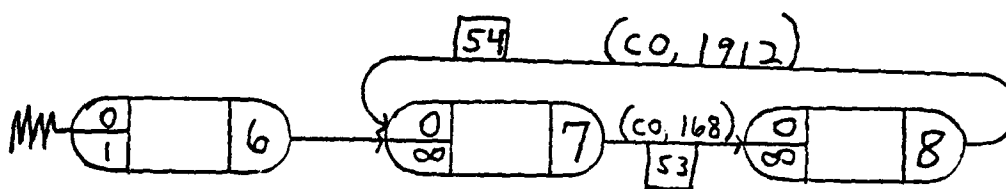
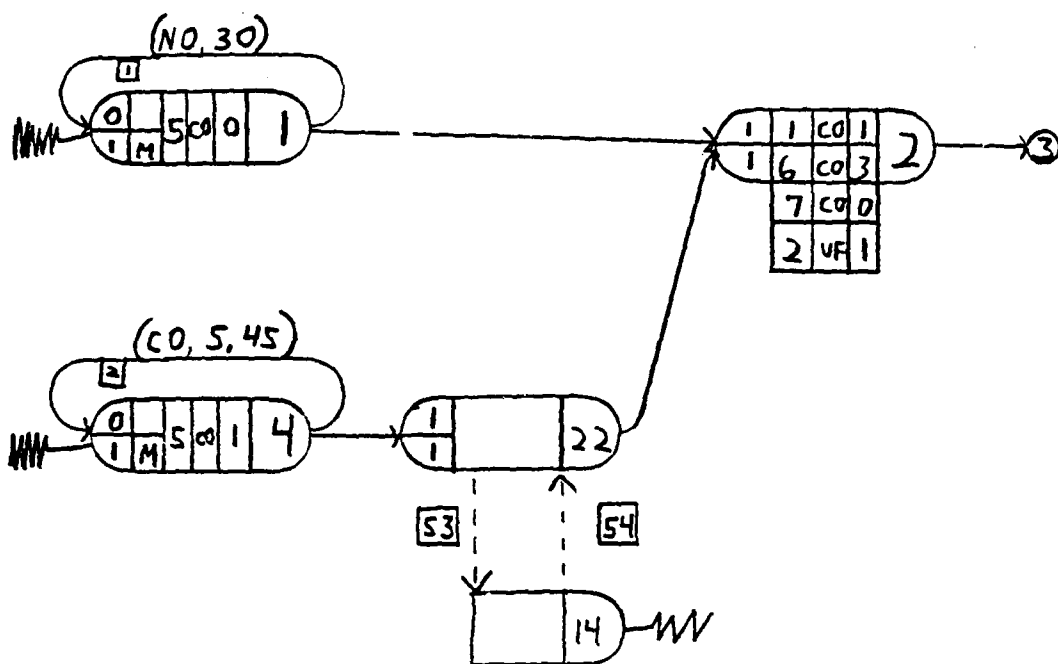


Figure 4
ARRIVAL ROUTINE

to measure time. The service time for the activity indicated by the number in the square box is '(NO,30)'.

'(NO,30)' is a distribution of numbers with a mean of 18.7735, and a standard deviation of 3.3175 hours. The computer will supply the model with the exact number. This number will be different for each PR which flows through this path, because the computer uses its random number generator to pick this number. The distribution of arrival times was determined by analyzing the arrival times of PR's to PMRNA in FY82 (25). Since there is no activity time indicated between Node 1 and Node 2, a PR would flow through this branch without adding time to its total contracting cycle time.

Node 2 is a regular node which assigns a specific buyer and clerk to each PR, and determines the PR network type. Buyer-A, Buyer-B, and Buyer-C each have a thirty percent probability of being assigned any specific PR. Buyer-D, who is also the PCO, has a ten percent chance of being assigned a specific PR. The buyers are considered to be equally competent in their jobs. The branch chief of PMRNA stated that the PCO should have forty percent of the buying workload of a journeyman buyer (12). The probability of a specific PR being assigned to a specific network type was determined using the actual frequency of occurrence of each network type in PMRNA in FY82 (25). After these assignments are made, the PR flows to Node 3, the traffic node.

In October 1982, 83 funding PR's were received in PMRNA. The rest of the fiscal year, an average of six funding PR's were received per month (25). Node 4 is a special source node that imitates this flood on fundings for one month of every year. The PR's from Node 4 must travel through Node 22, before going on to Node 2. Node 22 and Node 14 act as a switch which either permits the fundings to flow to Node 2, or derails the PR's. Node 14 has no path to Node 2 or to anywhere else. PR's which flow to Node 14 disappear. On November 1 of each simulated year, Node 22 is replaced by Node 14. Node 4 continues to generate PR's, but they never enter the contracting cycle.

Nodes 6, 7, and 8 compose the clock which sets the time for Node 22 and Node 14. When a PR is generated by Node 6, it flows to Node 7. The PR travels for 168 work hours to reach Node 8. As soon as the PR reaches Node 8, Node 22 is replaced by Node 14. At Node 8, the PR travels for 1912 hours to reach Node 7. As soon as the PR reaches Node 7, Node 14 is replaced with Node 22, and the contracting system receives another flood of funding PR's.

When Node 4 funding PR's reach Node 2, Node 2 assigns the buyers by the same method as described earlier, but all the PR's are assigned to the funding network.

Traffic Node and Sink Node

Node 3 is the traffic node (see Figure 5). It is one of

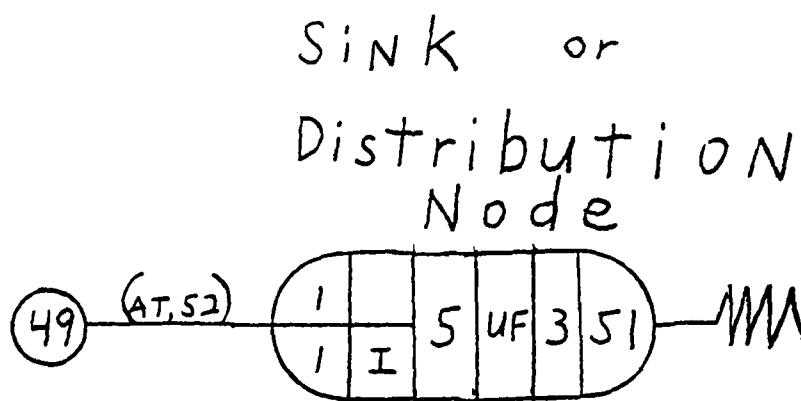
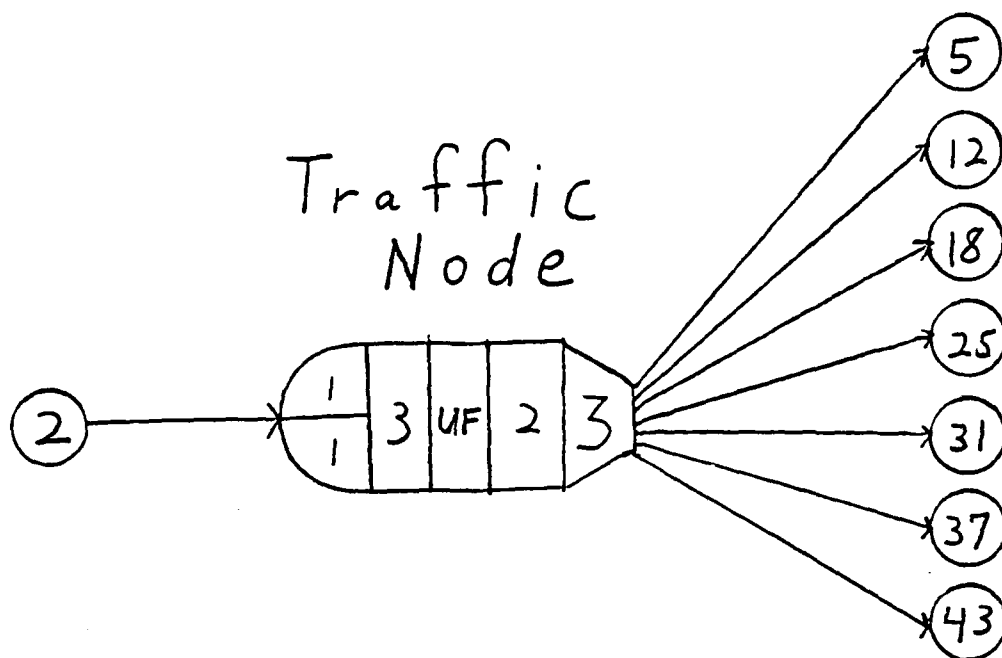


Figure 5

TRAFFIC AND SINK NODES

the only nodes which accesses the subroutine (3 UF 2). Whenever a PR flows through the traffic node, the map for the applicable network is consulted. Values are set in the attributes of each PR. In this model, each PR has 64 attributes. The attributes contain information which guide the PR through the correct nodes, when the PR has a choice of destinations. For example, if a PR is at node 5 (see Figure 7 on page 72), it has no choice of destinations; it must flow to Node 11. But if a PR is at Node 3, it has a choice of seven destinations. The subroutine will set the correct destination as "1" and the other six as "0", so the PR follows the proper course.

The subroutine sets the course of each contract in accordance with the map of the 28 types of contracts. But the subroutine is unable to set the path for a PR from the beginning to the end. The path must be set piece-meal, one step at a time. So each network is divided into many steps. At the beginning of every step, the PR flows through the traffic node for instructions. For example, the C2 network (a competitive purchase estimated to cost between \$ 10,000 and \$ 100,000) has seventeen (17) steps. The first step contains the following activities:

1. the PR flows from the traffic node (3) to the PCO (node 31),
2. the PCO's service time is computed for reviewing the new PR (attribute 43 = service time),
3. the PR flows from the PCO (node 24) to the

- assigned buyer's in-basket (nodes 5, 12, 18, or 25),
4. the buyers's service time is computed for writing the RFP package (attribute 42 = service time),
 5. the PR flows from the buyer to the clerk's in-basket (node 37 or 43),
 6. the clerk's service time for typing the RFP and preparing the solicitation file is computed (attribute 44 = service time),
 7. the PR flows to the traffic node(3) for the next step.

The reason that the clerk sends the PR to the traffic node is that the PR must return to the buyer. The buyer's service time (attribute 42) is already set as the RFP writing time. If the PR goes to the buyer twice in the same step, then the service time for doing two different activities would have to be the same. Since this rarely occurs, the PR must go through the traffic node so that the service time can be altered. Going through the traffic node has no effect on the simulated contracting cycle time.

The last step of each contractual action is where the contract award is sent to node 51, the distribution or sink node, where the time that each PR spent traversing through the contracting cycle is computed. Statistical information is gathered at this point, concerning the contracting cycle time of all PR's by network type. The mean of each network time is computed as well as the standard deviation, and a 90% confidence interval of the mean and a 90% confidence interval of the prediction of a sample. Q-GER™ also tabulates the percentage of time that each buyer, clerk and PCO is

working. The average time that a PR sat in someone's in-basket is retained, as well as the maximum and minimum number of PR's that were in each person's in-basket at any one time. This information should be very helpful to a manager for spotting bottlenecks.

Distribution Nodes

The distribution nodes are Node 11, Node 24, Node 49, and Node 50 (see Figure 6). Their function is to send the PR to the destination shown on the network map. The distribution node is shown as a combination of a conditional, take-first branching node and a table of the possible branching from the node. The distribution nodes are regular nodes in that no PR's wait for distribution. As soon as a PR arrives at a distribution node, the PR is distributed.

The tables of possible branching are not written in standard Q-GERT symbology. Because of the extensive branching, a non-standard format was required (see Figure 6). The first column (from the left) is the attribute numbers of the possible branching destinations. Attributes in Q-GERT are characteristics that are associated with a particular PR (22:29). In this model, each PR can carry up to 64 attributes at one time.

The next column in the table is the node number of the possible destinations. The third column is the name of the possible destinations. The fourth column is the service time

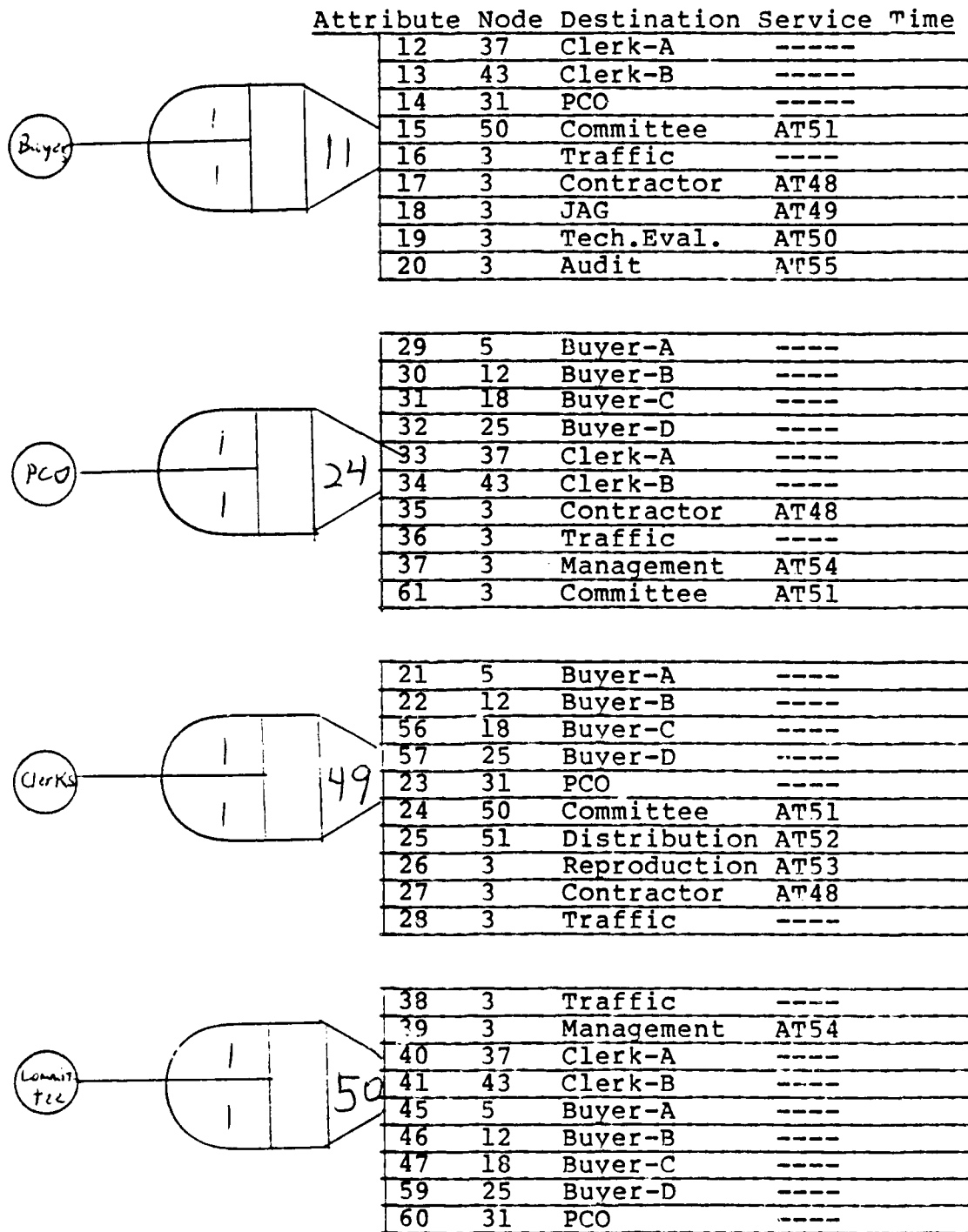


Figure 6
Distribution Nodes

that will be added to the contracting cycle time if the PR chooses the destination node in the same row. If there is no service time shown, then a PR routed to the destination in this row flows there without adding to the PR's contracting cycle time.

When a PR arrives at a distribution node, only one of the attributes listed in column 1 will be set to '1', all other attributes will be set to '0'. The setting of the attributes is performed when the PR flows through the traffic node (Node 3). So when a PR reaches a distribution node, its destination is predetermined. If the predetermined destination has a service time (column 4), then the service time was also set in the traffic node. For example, when a PR reaches Node 11, the PR goes to one of the destinations identified in column 2 of the table, depending on which attribute between 12 and 20, inclusive, is set to '1'. If attribute 15 is set to '1', then the PR flows to Node 50 (Committee). The service time shown in attribute 51 would be added to the total contracting cycle time of the PR.

All the destination nodes function in the same manner, but the attribute numbers are different. Every time a PR is routed to the traffic node (Node 3), all the attributes of the PR are reset in accordance with the network maps.

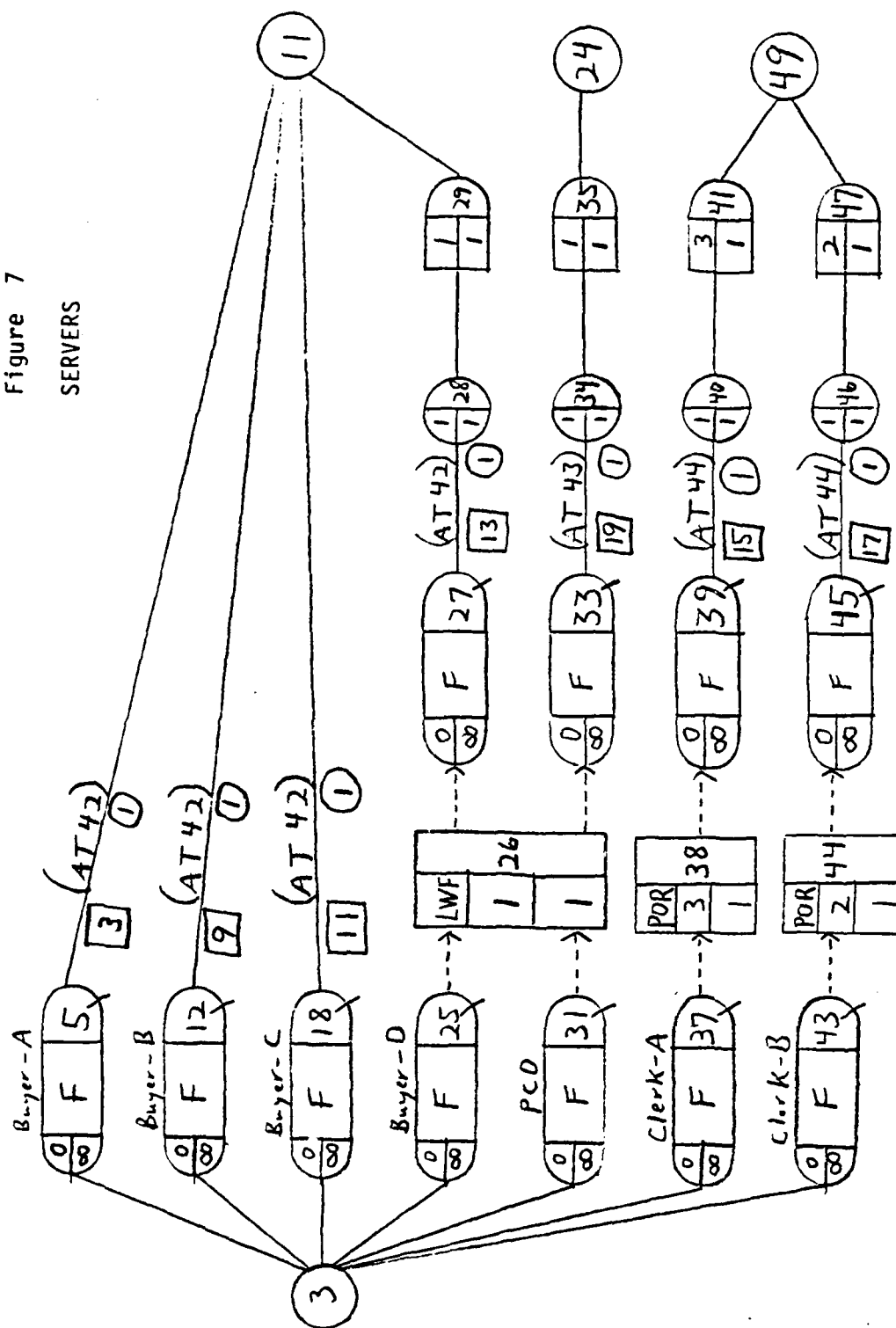
Servers

Three buyers, a buyer-PCO, and two clerks are modeled (see Figure 7). Nodes 5, 12, 18, 25, 31, 37, and 43 represent in-baskets for these workers. Each modeled person has one in-basket, except for the PCO, who has a separate in-basket (Node 25) for buying work, and another in-basket (Node 31) for PCO work. All the in-baskets have an unlimited capacity. The in-baskets are the queues which tend to build up if workload is heavy, and disappear if workload is light. Whenever a PR is forced to wait in a queue because the server (buyer, clerk, or PCO) is busy working on another PR, that waiting time is added to the total contracting cycle time for the PR.

The service time for each server is carried by each PR as attribute 42, 43, or 44. These attributes are set in the traffic node (node 3) in accordance with the service times collected from the experienced personnel in R&D Contracting who were sampled. Attributes 42, 43, and 44 are different for each PR and are changed by the traffic node many times during the processing of the PR in accordance with the network maps.

All servers work on PR's one-at-a-time. They follow first-in, first-out (FIFO) procedures in selecting work from their in-baskets. The buyer-PCO has two in-baskets, so an allocation node (26) decides which PR the buyer/PCO will work

Figure 7
SERVERS



on. The work in the queues is ordered in the FIFO method. The allocation node determines which of the two baskets has the PR which has been in either queue the longest. If that PR is in the buyer's queue, then the PR is moved to Node 27 and the service activity commences. When the service time has elapsed, the PR flows through Node 28, Node 29, and Node 11 to its new destination. When the PR passes through Node 29, the allocation node (26) is directed to pick another PR from either in-basket, and the process continues.

Clerk-A and Clerk-B each have only one in-basket. Their allocation nodes serve a different purpose than the PCO's allocation node. The branch chief of PMRNA stated that the typical clerk in his branch performs clerical duties for two buyers and a buyer/PCO (12). This would result in one clerk in the model being underworked, if additional work were not added. Burden is added in the Q-GERT subroutine to ensure that both clerks have a full workload. When Clerk-B works for two buyers and the buyer-PCO, no burden is added. But a burden of 1.4 times Clerk-A's workload is added because Clerk-A only types for one buyer in the model. When Clerk-A is processing a PR, the PR flows from nodes 37 to 39 and the service times stored in attribute 44 and the burden is added to the total contract cycle time of the PR. The allocation node keeps Clerk-A working on the burden after completing the work time associated with attri-

bute 44. Clerk-A is not available to work on another PR until the combined service time has passed.

For a more detailed look at the model, the complete model and Fortran subroutine are listed in Appendix B and Appendix C.

Assumptions and Limitations of the Model

1. DATA-CEN recognizes thirty-four different contract networks. Six of the thirty-four contract types are not included in the model. Three of the six are sole source, competitive and contract modifications under \$10,000. The procedures for these actions are very different from the other networks, because they follow the regulations governing purchase orders. Based on discussion with R&D personnel (12) these actions were considered to be relatively rare. Analysis of the data supported this assumption for two of the three; the small contract modification proved to be more popular. The other three non-modeled actions are : (1) The Basic Ordering Agreement (BOA), (2) Undefinitized/Unpriced Action/Letter Contract, and (3) the definitization of an undefinitized action. The BOA is only used in a few of the eleven buying branches in the Directorate. The other two actions are equally rare. These actions are so uncommon that it is unlikely that the model could predict the occurrence of these events, and any improvements suggested by the model for these actions would

not be worth the expense of including these networks in the model.

2. The model does not include exceptional contracting actions, such as any contract which takes a year-and-a-half to place on contract, or the buys which are cancelled before award.

3. The differences between fixed price contracts and Cost-Plus-Fixed-Fee Contracts (CPFF) are not recognized in the model. There may be some substantial differences in the contracting cycle among different contract types, but the experts who provided estimates did not mention this. If there are differences, the model was based on CPFF type contracts.

4. The model assumes that despite the unique nature of every contract, most contracts follow the same procedures (network map). The contracting procedures specified in the questionnaire were generally accepted by all the experts surveyed. There were minor differences. Some PCO's do not review PR's before their buyers review them. Some buyers perform their own filing.

5. There were some strong differences concerning the correct procedure for soliciting a small sole source buy. Many of the buyers assumed that a formal RFP would be required. The buyers' questionnaire was purposively vague on this point. But the clerk's questionnaire stated that a

letter RFP would be prepared. So the buyer's RFP preparation and review time is much longer than the clerical time. More research is required to clear up this issue.

6. Only the buyers, clerks, and PCO's are fully modeled. The other actors (Committee, JAG, contractors, etc.) lack queues (in-baskets). Instead, their service times include a standard or typical queuing time. So no conclusions can be drawn about the effect of workload, or any change in procedures, on these actors from the model.

7. The buyers, clerks, and PCO modeled are experienced people. Each person is fully capable of performing his or her job. Overall, each buyer (or clerk) will receive the same amount of work as any other buyer (or clerk). This is both a limit and strength of the model. It is a limit because in real life each person has a different capability of performing work. The strength of this is that the actors in the model are composites of the experts who provided estimates. So the actors are more quick and efficient than half of the sample, and less slow and inefficient than the other half of the sample. These composite actors may be more representative of the directorate than any single living person.

8. The first-in, first-out (FIFO) method of selecting work from a queue is not followed by all buying personnel in R&D Contracting. Many of the people sampled stated that

they follow the FIFO method , but make exceptions for: (1) PR's which require only a small amount of work (service time), (2) Fast Track PR's are processed before any others, and (3) PR's which they judge to be of high priority. These exceptions were not modeled.

Verification

Verification is the process of determining whether the model is internally consistent - does the model perform as the modeler expects it to perform. A careful review of the simulation output can verify that many aspects of the model work correctly. Statistical nodes can be added to the model to measure the service or arrival times. The results of the statistical nodes can be compared with the theoretical distributions by the use of the Chi Square test.

Statistical nodes can also measure whether the probability nodes are working properly. By requesting a trace, the output of the model will include a step-by-step movement of each transaction, so that proper working of the model can be verified.

Replacing all distributions with constants (the means) will generate a completion time which should be very close to a completion time which can be computed on paper using the PERT network procedure. If the model is not working properly, there should be a big disparity. Another verification technique which can be used, is to change a critical

distribution to ensure that the model is sensitive to important parameters.

One of the critical tests of the model is whether the attributes are assigned in accordance with the network map. When the model is running correctly, with no apparent problems, this information is not available to the researcher. But when the model fails to run correctly (which happens quite often during the construction phase of the program), Q-GERT will list each PR in the system, specify the value of each attribute, and its location (node) in the model when the model 'bombed'. Each of these will be checked to insure that they are correct.

Service Distribution Type

Picking the correct distribution type(s) is a problem for the modeler. Because of the method of collecting the service times (expert opinion instead of actual measuring), the correct distribution types cannot be determined statistically. Receiving the normal, optimistic, and pessimistic times for each service activity is compatible with four different types of distributions:

1. Triangular, where the optimistic and pessimistic distributions are the minimum and the maximum values and the normal value is the mode. The likelihood of any service time increases linearly from 0 at the extreme values to the mode.

2. Beta-Pert is often used for service activity times in PERT networks, although the network can take many different shapes (22:205).

3. Discrete, in which the service times for each activity takes one of three values: the normal time, the optimistic time, or the pessimistic time. The likelihood of each of the three is based on the percentages that the experts estimated that each occurred.

The triangular distribution appears to be most appropriate, but if this distribution fails in validation, then the others will be tested.

Model-building and testing are not go/no-go situations. Once the model works, the work is not over. The model can always be improved. Because the model is a simplification of reality, the model will never be true in all situations. The modeler attempts to make the model behave correctly for the tests which he or she wants to run.

Validation

Validation is to compare the output from the model with the real thing. One technique is to ask experts to distinguish the model results from historical or theoretical results. This is the Turing test. If the experts can not decide which results are from the model, then the model is considered valid.

A better test is to compare model predictions with

historical results. If the model is valid, the model should be able to duplicate the actuals of a previous year given that year's input. This test will be made on the model.

Starting Conditions

A buying organization does not start each year from idle conditions. Some contracts are carried over from one fiscal year to the next. So using a model which starts from idle conditions, could bias the output.

The modeler can determine an average amount of work-in-process and start the model from this busy condition, or he can run the model for a long time to get the model up to equilibrium conditions (an average workload). This technique is similar to warming up an engine; the test does not begin until everything is warmed up. The warm-up technique will be used, unless the computer time wasted in the warm-up is considered to be excessive.

To determine when equilibrium conditions are reached, the warm-up period will be run for one-quarter year, one-half year, three-quarters of a year, one year, and two years of simulation time. The service times, the completion times, and a few key queue node waiting times will be compared. The comparison should reveal when the equilibrium conditions are reached. Once the time to reach equilibrium is determined, each run of the model will include the warm-up time before the test is started; statistics will not be

collected before the model has reached the equilibrium state.

Variance Reduction

Unless the full model proves unfeasible, variance reduction techniques will not be used to simplify the model. The model will be used for post-thesis work, so a full model is desirable. But variance reduction techniques can be used in controlling the pseudo-random numbers which are used to generate the arrival time of new work and the service times of work-in-process. By insuring that the same random number streams are used for the arrival and service activities in a comparison of two contracting processes, the random variance of the output can be reduced, resulting in better accuracy and a smaller sample size. This technique will be used in comparing the present contract procedures with modified contract procedures (fewer administrative reviews) to answer research question four.

Plan for Experimentation

Research Question 1

Research question 1 is to determine an optimum ratio of buyers-to-clerk for the Flight Dynamics Branch (PMRNA) of R&D Contracting. The model will imitate the actual PR's that were received in FY82 by this branch. The three buyers, two clerks, and buyer/PCO in the model will be expected to

handle a percentage (estimated by the branch chief of PMRNA) of this workload. Initially, the first clerk will handle the clerical duties for Buyer-A only. The second clerk will perform the clerical duties for Buyer-B, Buyer-C and the buyer/PCO. The model will simulate a year of contracting. The year will be replicated ten times to reduce year-to-year variation. The model will determine the service utilization percentages for the buyers, clerks, and PCO, which will show the percentage of time that each was working. If the buyers are busier than the clerks, then the clerks might be able to perform clerical duties for a larger number of buyers or buyer/PCO's. If the results of the model show that the clerks are busier, then there would be a case for reducing the buyer-to-clerk ratio. The contracting cycle times will be compared. The smaller the buyers-to-clerk ratio, the shorter the contracting cycle should be. The percentage change will be recorded, and may be more significant than the server utilization comparison. This will be discussed in the next chapter.

Research Question 2

Research question 2 is to determine an optimum level of work for a PCO with three buyers. A process similar to the process used in answering research question 1 will be followed. The server utilization times of the three buyers will be compared with the combined server utilization time

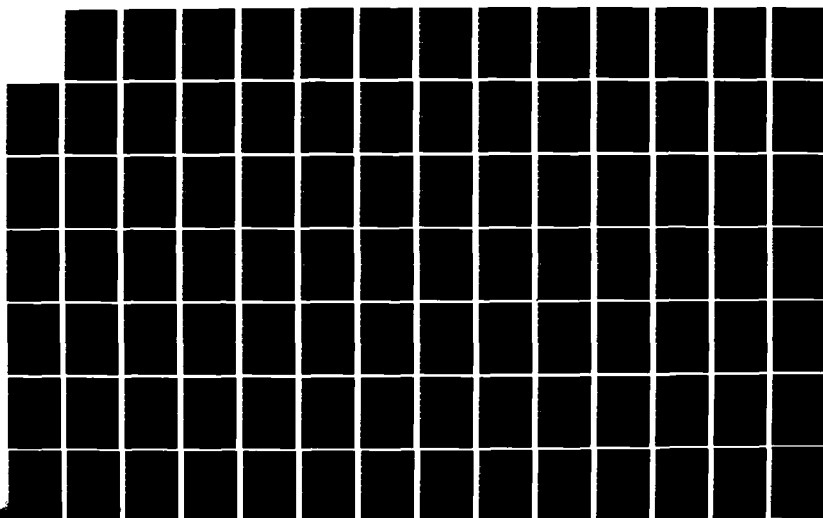
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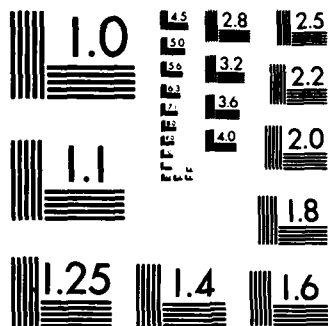
Q-GERT MODEL OF THE CONTRACTING CYCLE(U) AIR FORCE INST 2/8
OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYSTEMS AND
LOGISTICS C D MILLER SEP 83 AFIT-LSSR-118-83

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of Buyer-D and the PCO (Buyer-D and the PCO are the same server). The workload will be increased and decreased for comparison purposes. The effect on the contracting cycle will be documented.

Research Question 3

Research question 3 is to plot the contracting cycle time against the percentage of the PMRNA workload that the servers in the model are processing. The branch chief of PMRNA believes that forty percent of the branch's workload is the amount which he would expect the workers imitated in the model to perform (12). This percentage will be varied from twenty percent to sixty percent, in five percent intervals. There is expected to be a point where a slight increase in workload will cause a significant increase in the contracting cycle time.

Research Question 4

Research question 4 is to reduce or eliminate an administrative review to determine its effect on the contracting cycle. Network F1, the funding network, will be remapped to eliminate the committee's review. This should demonstrate the effect that one change in one network has on the contracting cycles of all the networks.

Computer Programs

Four computer programs are listed in the appendix, as

Appendix A, Appendix B, Appendix C, and Appendix D. The first program, Net, is written in Fortran and was used to build the third program, the Fortran subroutine to the Q-GERT model. Net was used to build the twenty-eight network maps. Like all computer coding, any mistake (mental or clerical) can prevent a program from working properly. Finding a mistake in computer coding is often a time-consuming activity. This program, Net, prevents clerical mistakes and guides a person who is familiar with the contracting process to build a network without learning to program a computer. This program will be needed in the future to update the model if procedures change and for testing new procedures in contracting.

The second program is the model written in the Q-GERT simulation language. Changes in the number of runs, the time that the model should simulate (one year, two years, etc.), the start-up time, the workload, and the ratio of buyers-to-clerks can easily be adjusted in this program. To run the simulation requires this program, the subroutine (program three), and the Q-GERT procedures file (QGPROC).

The third program is the Fortran subroutine to the Q-GERT model which contains the network maps, assigns specific buyers and networks to each PR, and records the contracting cycle time for each PR by network.

The fourth program is the Q-GERT procedures file

(QGPROC), which runs the simulation on the ASD Computer Center's computer system at Wright-Patterson AFB. Batching this program to the ASD's Cyber computer will run the computer model. The model uses 300,000 units of core memory, so the program cannot be run interactively.

Summary

This chapter described the methods used to gather data for the construction of the model, and the plan for experimenting with the model after it was constructed. The next chapter will describe the results of the experimentation, and answer the research questions.

CHAPTER IV

DATA FINDINGS AND ANALYSIS

The purpose of this chapter is to report and analyze the results of the study. Interpretation of the results will permit the answering of the research questions. The objective of this study is to develop a computer model of R&D Contracting which can be used to predict the effect of changes in policies, procedures, and organizational structure on the contracting cycle. The first part of this chapter describes the interpretation of data collected from the sample of expert opinion in R&D Contracting, and the verification and validation of the model. The last part of the chapter describes and analyzes the research experimentation.

Interpretation of Data Collected

As described in Chapter III, data was needed on the service time for each activity in the contracting process. Data was collected by the subjective technique of asking experienced personnel to estimate the time required to perform each activity. The data was analyzed by determining the mean, the standard deviation, the median, and the number in the sample for each of the three estimates collected on each activity. An analysis of this data showed that the median was consistently smaller than the mean. By putting

the data in histograms, it was observed that the majority of the estimates were situated in the lowest quartile. To determine when to use the median instead of the mean as the point of central tendency, McClave and Benson (17:61) present a similar situation in which the Delphi technique was used to collect estimates from experts. Based on the information and example provided by McClave and Benson, and the similarity to this situation, the median was chosen as the most representative point of central tendency. The normal estimate, as well as the pessimistic estimate and the optimistic estimate, are the median values of the estimates collected.

Verification

Verification is the process of determining whether a model performs as the modeler expects it to perform. The first step in verifying the model was to replace the variable service time distributions with constants. Each service time in the C2 network was replaced with the median value of the normal estimate of that service time. The model was run with only one PR flowing through this C2 network. The contracting cycle time from the model matched the hand-calculated total of the means of the service times.

The second test was to run 100 PR's through a number of networks to ensure that the service distributions functioned

properly. The time between arrivals of the PR's was set at a large amount, so that there were few PR's in the contracting process at any one time. This reduced the queuing time to a minimum. The result of the test was that the average contracting cycle time was slightly above the total of the means of the service times (which was expected because of the small amount of queuing time), so the test was successful.

The third test was to examine whether the sixty-four attributes of each PR flowing through the model were being assigned correctly, a critical feature of the model. Every attribute of over 100 PR's of various networks and in various stages in the contracting process was examined. Every attribute was correct.

The fourth test was to trace a PR through the Q-GERT model. This trace provided an output which listed, in chronological order, every node that the PR flowed through. The PR flowed through each node in accordance with the network map. This test was successful.

The percentage of PR's of each network type generated by the model were compared with the actual percentage of PR's of each network type processed by the branch of R&D Contracting being modeled. The percentages were the same, proving that the pseudo-random generator in the Q-GERT model was working as expected.

The modeler concluded that the model was internally consistent; the model performed as it was expected to perform.

Validation

Verification is the process of proving that the model is internally consistent; validation is the process of showing that the model accurately simulates what its designed to imitate. This model was designed to simulate the contracting cycle time of the Flight Dynamics Branch (PMRNA) of R&D Contracting. The model attempts to simulate the arrival and subsequent contracting cycle times of PR's received by PMRNA in FY82. This is a crucial test of the model. A model is designed to be used to predict events which are in the future. For example, the model might be used to predict the effect of the hiring of an additional worker on the contracting cycle time. But the decision-maker must have faith in the model's ability to make accurate predictions. A test which can create faith in the decision-maker is to use the model to predict events which have already happened. The model is fed the inputs of the past to determine whether the model can accurately predict the events that have already occurred. This is a crucial test and a very demanding one. It is also a test that this model initially failed.

The actual numbers and average contracting cycle times of the PR's received in PMRNA in FY82 by network type are listed in Table I. There was a problem with some of the networks, because the DATA-CEN system was revised at the beginning of FY82, so there were some networks which were replaced by new networks. Network F1 includes PR's from obsolete network C4. Network M0 includes PR's from obsolete network C5. These obsolete networks, C4 and C5, have exact counterparts in the new networks, F1 and M0. The row of Others are PR's which were processed under networks which are no longer used by the DATA-CEN system. These obsolete networks were broader than the new networks, so the results of these networks cannot be accurately converted into the contracting cycle times for the new networks. The hours spent on the Other networks are not included in the total average contracting cycle time. Other also contains networks M1 and D1 because these networks were not modeled.

The number of PR's in each network is only 25% of the PR's actually processed through the model. The model processed PR's for ten years, instead of one year, to increase the accuracy of the sample. Since the model only processed 40% of the workload of PMRNA each year, to compare the model with actuals the total from the ten years of PR's must be reduced to 25% of its ten year value as follows:

1 Year of Actual PR's = 0.25 times 10 Years of Modeled PR's
(40% Workload)

TABLE 1
Actual Vs Modeled PRs and Cycle Times

Networks	FY82 PRs	Cycle Times	Model PRs	Cycle Times
C2	2	1089	2	1379
C3	6	935	5	1542
C4	5	1273	5	1539
C5	1	1371	1	1832
C6	2	1417	1	2044
C7	6	1641	4	1724
C8	2	1371	2	2258
F2	2	851	2	1377
S2	4	471	5	1093
S3	1	320	1	1276
S4	1	1103	1	1260
S5	-	--	-	--
S6	-	--	-	--
S7	1	663	1	1943
S8	-	--	-	--
C9	2	360	2	828
F1	147	136	142	236
M2	18	409	25	958
M3	5	489	5	1136
M4	4	691	4	1062
M5	3	411	2	1088
M6	1	1217	1	1781
M7	3	431	4	1598
M8	-	--	-	--
F4	7	256	8	957
A1	24	116	25	110
F3	24	468	25	997
M0	58	184	59	375
Others	20			
Total/ave	349	304	335	558
Index	100	100	96	184

The model imitated the number of PR's by network type accurately. The model and actual number of PR's in each network type were usually quite close. The contract cycle times were quite different. The contracting cycle times of the model were consistently higher than actual contracting cycle times. The average contracting cycle time of the PR's in the model was 84% higher than actuals (558 hours - modeled versus 304 hours - actuals).

The model overestimated the contracting cycle times of almost every network, so the modeler searched for a problem which affected all networks. The problem was found in the model's adjustment to labor hours to account for holidays, leave, and non-DATA-CEN activities. The model imitates the yearly operation in PMRNA. Personnel in PMRNA work forty-hour weeks; there is very little overtime (11). With fifty-two weeks in the year, there are 2080 hours available for work. Holidays, vacation, sick leave, administrative leave, training, and other miscellaneous activities reduce the number of hours which each employee is available for performing the modeled work. Because much of this non-modeled activity occurs at different times for different employees, the model makes each worker unavailable for modeled work for small periods throughout the year, instead of merely reducing the work year by the time spent on non-modeled activity.

When buying personnel are on-the-job, they do not spend all their time working on activities which are included in the model. Clerks spend time sorting the mail, and performing computer validations. Buyers spend time attending meetings with engineers and contractors which do not result in contractual actions. PCO's process many administrative documents which are required, but not included in the model. PCO's also train buyers and substitute for socializing personnel.

A list of the non-modeled work activities was provided in the questionnaire. The experts estimated the time spent on the non-modeled work. These estimates were analyzed in the same manner as the estimates of the service activities. The results are listed in appendices F, H, and J.

During the interview, each expert was asked for an estimate of the amount of the work day that he (or she) spends socializing or taking breaks. This data was analyzed in the same manner as the estimates on the service activities. The results of this survey of the amount of time which is spent on non-DATA-CEN work is presented in Table 2.

Since the model accounts for 2080 hours in a year, the buyers, clerks, and the PCO in the model must be made unavailable to perform work for the calculated percentage of the year that each worker spends on non-modeled activity. This was done in the model by adding non-modeled time to

TABLE 2
Modeled Work Hours in Year

	PCO	BUYER	CLERK
Total Hours in Year	2080	2080	2080
Total Leave, Holiday	540	540	540
Hours at Work	1540	1540	1540
Time Spent on Non-Modeled Work	647	493	400
Time Spent Non-Productively	120	286	131
Time Available For Modeled Work	773	761	1009

each service time performed by the buyers, clerks, and the PCO. The non-modeled time is a percentage of the working time. The percentages used were:

PCO 169% of working time [(2080 hours/773 hours) - 1]

Buyer 173% of working time [(2080 hours/761 hours) - 1]

Clerks 106% of working time [(2080 hours/1009 hours) - 1]

The model adds vacation, non-DATA-CEN work time, and non-productive time to each service activity. Whenever one of the buyers, clerks, or the PCO works on a PR, time is added to the service time for these non-modeled activities.

The problem with using this method for accounting for non-modeled time is that working activities and non-working

activities have equal priority in the model. Each server works on non-modeled activities without considering whether the non-modeled activities are as important as the modeled activities. Experienced personnel in R&D Contracting (11,15) stated that much of the non-modeled work has a lower priority than the modeled work, so the buyers and PCO's would not perform some of the non-modeled work until they were idle. They estimated that at least 25% of the non-modeled time would be spent on this low priority work.

To more accurately simulate the contracting cycle time, the modeler deleted the accounting for the low-priority, non-modeled work in the model. This low-priority work makes up 17.5% of each of the buyer's and PCO's workload. So the model was modified to reduce the percentage of non-modeled activities which would be performed after each service activity. The non-modeled times which are added to the service times as a percentage of work time were changed to:

PCO 129%

Buyer 132%

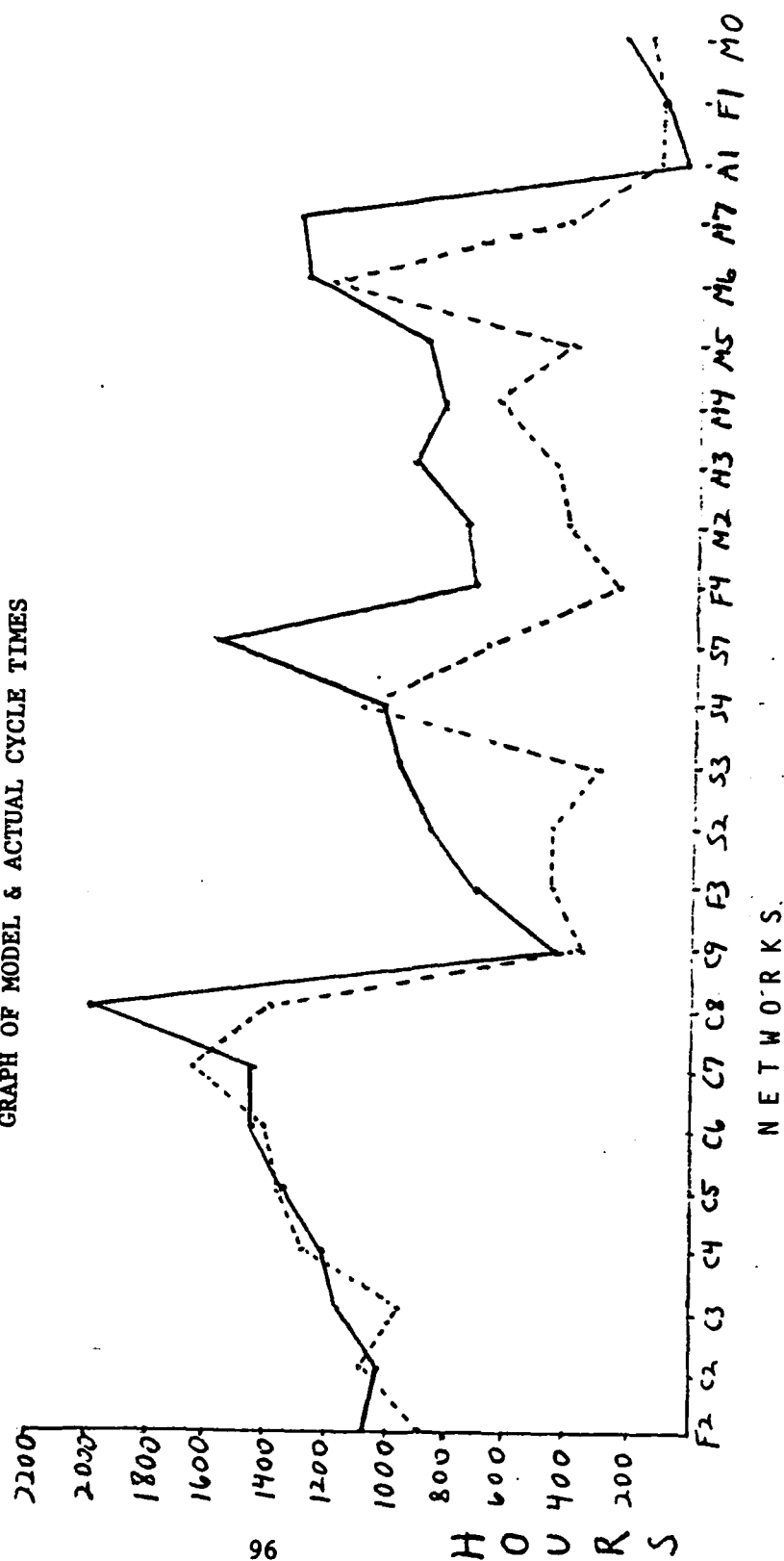
Clerk 106% (unchanged).

With this change, the contracting cycle times predicted by the model were much closer to the actual contracting cycle times (see figure 8).

MODEL
ACTUALS

Figure 8

GRAPH OF MODEL & ACTUAL CYCLE TIMES



Analysis of Figure 8

The twenty-four networks are listed on the X-axis (four of the modeled networks received no PRs, so they are not plotted). The contracting cycle times (in hours) are listed on the Y-axis. The dotted line connects the discrete points of the average actual time that each network was completed in PMRNA in FY82. The solid line connects the discrete average contracting times projected by the model for each network.

The projected contracting cycle times for the competitive contracts (F2 through C9) for the model compare favorably with the actual contracting cycle times. Network C8 is the only anomaly. Actuals for the C8 network (competitive contract between \$3.5 million and \$10 million) for both PMRNA and for the Directorate (not shown) are lower than the actuals for network C7 (competitive contract between \$1 million and \$3.5 million). Network C8 has all the procedures of network C7, and additional reviews, so it is logical to expect the C8 network to have a longer contracting cycle time than the C7 network. Since the C8 network has a shorter contracting cycle time, another factor must be influencing the results. The branch chief of PMRNA suggested two possible factors (11):

1. better buying personnel are assigned to the larger, more complicated contracts,

2. the high dollar PR's have a higher priority than other contracting actions, so queuing times for these actions are reduced.

Another factor which might explain the anomaly, is an inadequate sample. Only 10 C8 networks were processed in FY82. The model may be correct; the actuals may be unrepresentative of the population.

Networks F3 through S7 are the sole source contracts. The difference between the output of the model and the actual output is significant. The service times collected on the solicitation phase of these sole source PR's appear to be erroneous. The service times collected are very similar to the service times collected for the competitive PR's. The buyers apparently estimated the time for preparing a full solicitation package (including model contract) on the sole source PR's. The researcher expected the estimates to reflect the time required to prepare a letter solicitation. Instead, the estimates received reflect the time required to prepare a full solicitation package. The actual contracting cycle times are so short, that letter solicitations must have been used. So why did the sample of buyers make estimates on the full solicitation package? A former member of Committee (30) stated that letter solicitations are not authorized; the buyers are supposed to prepare full solicitation packages for all sole source solicitations. To

improve the model, a sample of the sole source contracts should be reviewed to determine whether letter solicitations are commonly used. If letter solicitations were used, new estimates on the service times for processing sole source PR's should be collected.

Networks F4 through M7 are the contract modifications. Although the actual contracting cycle times appear to be considerably smaller than the model's projections, the model's projections are probably more accurate. The experienced personnel in R&D Contracting who took part in the survey stated that the PR for any modification is not usually received at the beginning of the contracting cycle. The PR is usually received with the technical evaluation of the contractor's proposal. Sometimes the PR is not received until after the completion of negotiations. So the contracting cycle times shown as 'actuals' do not include the entire contracting cycle time.

The administration networks (A1, F1, and M0) are reasonably replicated by the model. The addition of a priority factor into the model could increase the accuracy of the model. Administrative notices (A1) usually have a low priority, so a longer contracting cycle would be expected. Fundings (F1) with a higher priority would have a shorter contracting cycle time.

In summary, the competitive networks (except network C8)

and the administrative networks are accurately modeled. The modification networks are probably accurate, but this cannot be proven. The sole source networks are inaccurate, but they contain the smallest number of PR's, so the effect on the total model is minimized.

Variance Reduction

Variance reduction was employed in the model by using the same seed for each experiment. This means that the model used the same random numbers in each experiment. Controlling the variance was also performed by running each experiment for a ten-year simulation period, which increased the sample to decrease the variation of the results.

Service Distribution Type

The triangular distribution was employed on all service times. Because the model appeared to perform properly with the triangular distribution, the alternative distributions (Beta-PERT or discrete) were not tested.

Starting Conditions

Starting the model from idle conditions would not be representative of the organization being modeled; some work is received one year and processed the next year. To determine the equilibrium state of the model (the point where a longer warm-up period has no effect on the workload in the

model) six different start-up periods were tested:

1. no starting conditions (0 hours),
2. three months (520 hours),
3. six months (1040 hours),
4. nine months (1560 hours),
5. one year (2080 hours),
6. two years (4160 hours).

The results are shown in Table 3.

TABLE 3
Starting Conditions

Starting Conditions	0	520	1040	1560	2080	4160
Average Contract Cycle Time (hours)	268.2	351.5	428.5	384.0	418.8	456.5
<u>Server Utilization</u>						
3 Buyers	59.5%	68.7%	73.3%	69.2%	71.0%	72.9%
PCO	55.6%	58.5%	65.4%	62.7%	65.5%	61.8%
Clerks	46.0%	53.1%	59.9%	56.2%	58.2%	59.0%
<u>Queue</u>						
3 Buyers	1.08	2.04	2.62	1.56	2.19	2.66
PCO	.99	1.49	2.55	1.95	3.00	1.84
Clerks	1.20	.97	1.07	1.00	1.18	1.11

The table indicates that with starting conditions of 1040 hours (six months of warm-up time) or more, the model reaches equilibrium conditions. A starting time of 2080 hours was used throughout the experimentation.

Results of Experimentation

In analyzing the results of the experimentation, the following statistical tests were performed to compare the means of the average contracting cycle times:

1. T-Test

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_a: \mu_1 - \mu_2 \neq 0 \text{ (i.e., either } \mu_1 > \mu_2 \text{ or } \mu_2 > \mu_1).$$

Assumptions: (1) both populations are normally distributed, (2) both population variances are equal (this is confirmed in the second test).

$$T\text{-critical (N = 10, } \alpha = .05) = 1.833$$

$$T\text{-calculated} = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{S_p^2 \left(\frac{1}{N_1} + \frac{1}{N_2} \right)}} \text{ where } S_p^2 = \frac{(N_1 - 1)S_1^2 + (N_2 - 1)S_2^2}{N_1 + N_2 - 2}$$

Decision Rule: If T-calculated > T-critical then reject H_0 .

2. F-Test

$$H_0: \frac{\sigma_1^2}{\sigma_2^2} = 1$$

$$H_a: \frac{\sigma_1^2}{\sigma_2^2} \neq 1$$

$$F\text{-critical (N = 10, } \alpha = .05) = 3.18$$

$$F\text{-calculated} = \frac{S_1^2}{S_2^2}$$

Decision Rule: if F-calculated > F-critical then reject H_0 .

These tests will be used to answer the research questions.

Research Question 1

Research question 1 was to determine an optimum ratio of buyers-to-clerk for the Flight Dynamics Branch (PMRNA) of R&D Contracting, assuming a workload similar to the actual workload of that branch in FY82. The three buyers, two clerks, and buyer/PCO were expected to perform 40% of the actual workload of the branch (11). The standard ratio of buyers-to-clerk is 2.4 to 1. One clerk is expected to perform clerical duties for two buyers and one buyer/PCO. The model assumed that the PCO only generates clerical work when performing as a buyer.

The buyer/PCO carries 40% of the buying workload of a journeyman buyer. This ratio was varied to 2 to 1 and 3.4 to 1. The workload for the buyers and buyer/PCO was constant throughout the tests (given the normal random variations). Table 4 contains the significant results of the experiment.

A reduction from the standard 2.4:1 ratio decreases the average contracting cycle time by 7.3 percent. This difference is statistically significant (see Table 5). Increasing the buyer-to-clerk ratio does not make a statistically significant difference to the average contracting cycle time. The clerks' server utilization time increases as the clerks' workload increases. The number of PR's sitting in the clerks' in-basket increases and the time that

TABLE 4

Buyer-to-Clerk Ratio

Ratio	2 : 1	2.4 : 1	3.4 : 1
Average Contracting Cycle Time (hours)	390.3	418.8	413.1
<u>Server Utilization</u> Clerks	46.8%	58.2%	81%
Average Number of PR's in Clerk's Queue	.68	1.18	4.53
Average Time of PR's in Clerk's Queue (hours)	3.03	6.00	9.77

the average PR sits in the in-basket increases from three hours to almost ten hours.

The T-calculated values are shown in the top half of Table 5. The values which are greater than the T-critical value of 1.833 are designated with an 'X'. This designation means that in comparing the means of the average contracting cycle times, the differences are statistically significant (i.e. the null hypothesis is rejected). When the T-calculated value fails to exceed the T-critical value, this condition is designated with an '0' in the bottom half of Table 5. The '0' designation means that in comparing the means of the average contracting cycle times, the difference

TABLE 5
Buyer-to-Clerk T - Statistics

	<u>2 : 1</u>	<u>2.4 : 1</u>	<u>3.4 : 1</u>
2 : 1	----	4.18133	3.22125
2.4 : 1		----	0.70004
3.4 : 1			----
2 : 1	----	X	X
2.4 : 1		----	0
3.4 : 1			----

T-calculated is shown in table.

T-critical = 1.833 n = 10. α = .05

X = Difference (row and column) is statistically significant.

0 = No statistical difference. Null hypothesis cannot be rejected.

results in insufficient evidence to reject the null hypothesis. There is no statistical difference between the means.

Clerical workload can be increased from its present level up to 40% without significantly effecting the average contracting cycle time. A reduction in clerical workload reduces the average contracting cycle, slightly.

Research Question 2

Research question 2 was to determine an optimum level of work for the PCO who reviews and signs for 3 journeyman buyers. The branch chief of PMRNA (12) stated that he would expect this PCO to carry 40% of a journeyman buyer's workload in addition to his PCO duties. The PCO's buying workload was changed to 20%, 30%, 50%, and 60% of a journeyman buyer's workload. No work was added or subtracted from the total workload that was in the branch. The PCO merely performed more or less of the buying workload. When the PCO carried a larger workload, each of the buyers had a smaller workload. The results of this experiment are shown in Table 6.

TABLE 6
PCO Workload

PCO Workload	20%	30%	40%	50%	60%
Average Contract Cycle Time (hours)	405.4	410.8	418.8	493.4	453.7
Buyers Utilization	74.8%	74.7%	71.0%	73.6%	73.0%
PCO Utilization	48.5%	59.4%	67.5%	79.7%	77.0%
<u>Waiting Time in Queue</u>					
Buyer's Queues	10.9	12.7	10.0	12.1	11.3
PCO's Queue	2.7	4.6	11.4	15.6	10.7

TABLE 7
PCO Workload T - Statistics

	20%	30%	40%	50%	60%
20%	--	.822707	1.77099	11.2084	5.85956
30%		--	1.14885	11.3586	5.57632
40%			--	9.11044	4.07487
50%				--	4.50248
60%					--
20%	--	0	0	X	X
30%		--	0	X	X
40%			--	X	X
50%				--	X
60%					--

T-calculated is shown in table

T-critical is 1.833. N = 10. α = .05

X = Difference (row to column) is statistically significant.

0 = Difference (row to column) is not statistically significant. Null hypothesis is not rejected.

The T-calculated values are shown in the top half of Table 7. The values which are greater than the T-critical value of 1.833 are designated with an 'X' in the lower half

of the table. The 'X' designates that the difference between the means of the average contract cycle time of the row and the column are statistically significant. For example, if the PCO's buying workload were increased from 30% of a buyer's workload to 40% of a buyer's workload, the increase in the average contract cycle time is not statistically significant. The T-calculated value of 1.14885 is less than the T-critical value of 1.833, so the T-test states that the means should be considered to be the same. This conclusion results in an '0' being placed in the lower portion of the table. When the difference between the means is significant, as in the difference between a workload of 40% and a workload of 50%, the T-calculated value of 9.11044 is greater than the T-critical value, so an 'X' is placed in the lower part of the table.

Increasing the PCO's workload from 20% has a negative effect on the average contracting cycle time. As the PCO increased his workload, the waiting time of contracting actions from the buyers increased from 2.7 hours to as high as 15.6 hours. The amount of work relief that the PCO could offer the buyers by the PCO shouldering more of the buyer's workload did not offset this loss of efficiency in the PCO reviewing cycle.

Research Question 3

Research question 3 was to plot the contracting cycle

time against the percentage of the PMRNA workload that the servers in the model are processing. Figure 9 is this plot.

If the servers in the model perform more than 35% of the branch's workload, the contracting cycle time increases rapidly with each increase in workload. At 55% and 60% of the branch's workload, the model failed to complete the simulation for ten years, because the amount of work-in-process became too great for the simulation language (Q-GERT can process up to 100 PR's simultaneously). The plot points for both workload 55% and 60% are averages for one year instead of ten years, so they are much less reliable as statistical averages.

Table 8 is a comparison of the average contract cycle times for the specified workloads. The T-calculated values are shown in the top half of the table. In the lower half of the table, the T-calculated value is interpreted. An 'X' means that the difference between the average contract cycle time of models specified in the row and column headers is statistically significant. An '0' designs that, statistically, the two averages are the same. If there were no statistical differences between any of the averages, then workload would have no effect on contracting cycle time.

A designation of 'F' in Table 8 means that the comparison of averages could not be performed by the T-test because the assumption of equal variances could not be sup-

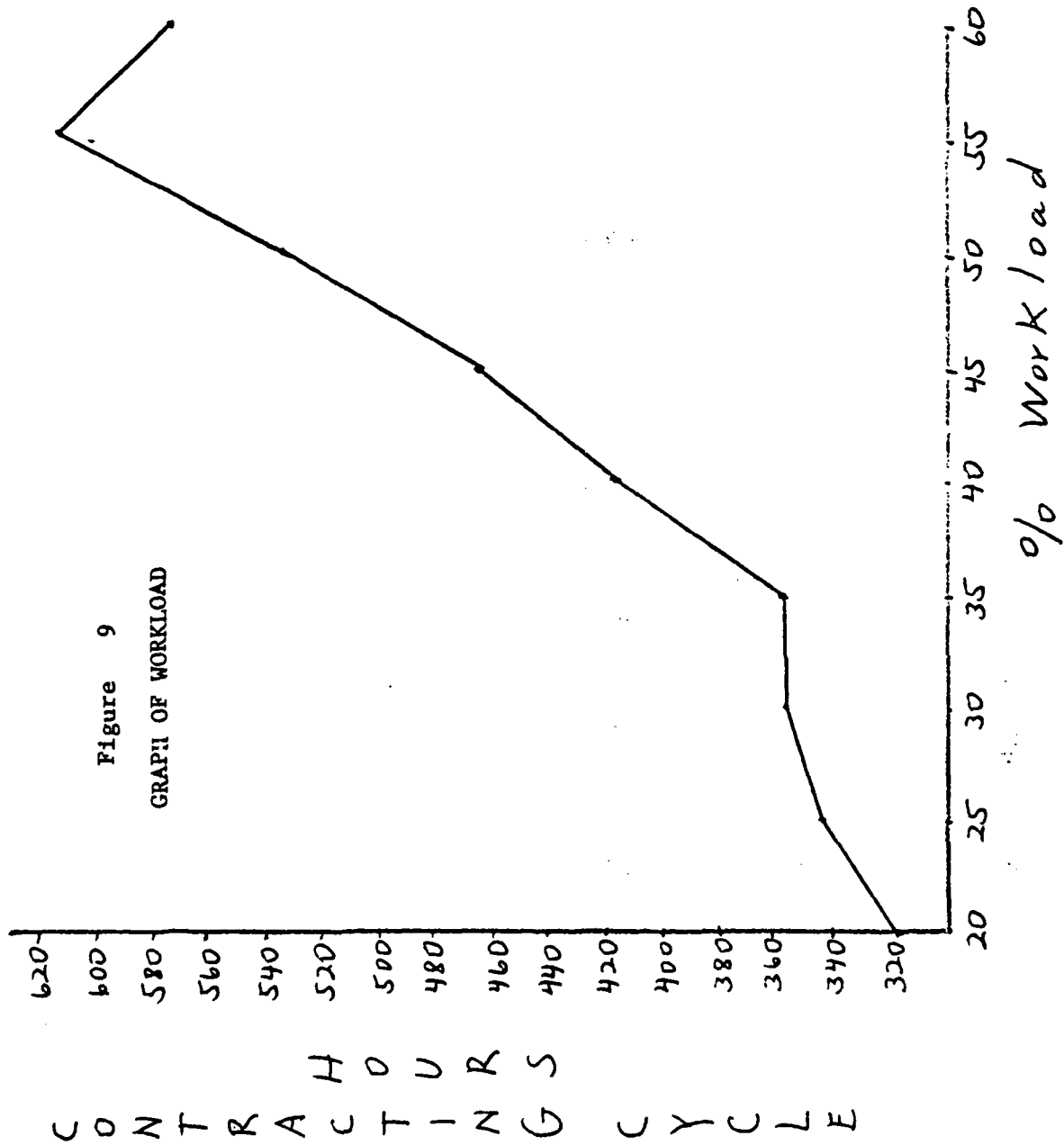


TABLE 8
Effect of Workload on Contracting Cycle

	20%	25%	30%	35%	40%	45%	50%	55%	60%
20%	--	4.2	5.3	5.6	14.2	16.3F	28.4	67.8	59.3
25%		--	1.6	2.2	10.8	13.7F	25.4	64.8	55.9
30%			--	0.5	8.2	11.7	21.8	47.9	41.1
35%				--	7.4	11.0	20.6	43.6	27.2
40%					--	5.1	13.9	34.6	28.0
45%						--	6.5	17.8	13.2
50%							--	12.2	13.2
55%								--	5.8
60%									--
20%	--	X	X	X	X	F	X	X	X
25%		--	O	X	X	F	X	X	X
30%			--	O	X	X	X	X	X
35%				--	X	X	X	X	X
40%					--	X	X	X	X
45%						--	X	X	X
50%							--	X	X
55%								--	X
60%									--

T-calculated is shown in table

T-critical = 1.833. N = 10. α = .05

X = Difference (row to column) is statistically significant.

0 = Difference (row to column) is not statistically significant. Null hypothesis cannot be rejected.

F = Failed F test, assumption of equal variances is not supported, so result of T test is suspect for individual comparison.

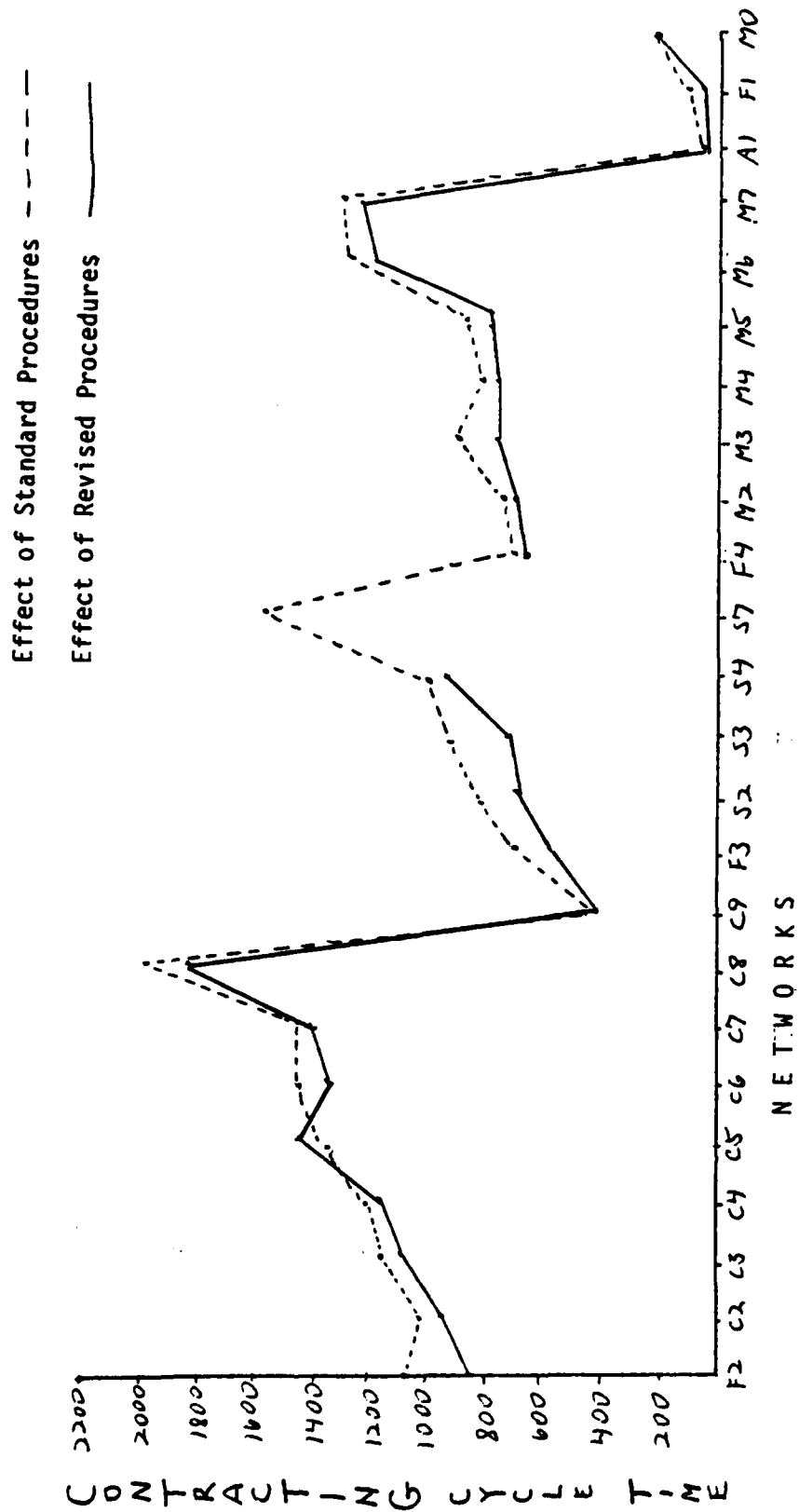
ported. Other statistical tests could be used to determine whether the difference between the averages are statistically significant, but additional tests are not necessary in this situation. Since there is a statistically significant difference between the 40% workload and the 35% workload, and there is a statistically significant difference between the 35% workload and the 25% workload, then there must be a statistically significant difference between 40% and 25% (the average contracting cycle time consistently increases from 20% to 40%). The failure of the F-test is considered to be a Type II error (17:285).

Research Question 4

Research question 4 was to determine the effect on the contracting cycle of eliminating the Committee review of funding actions (network F1) from the required procedures. The effect was very significant (see figure 10). The overall effect on the average contracting cycle time was to reduce

Figure 10

Graph of Contracting Cycle with New Procedures



the average from 418.8 hours to 338.5 hours, a 19% reduction. Making a change in the funding process should have a big effect on all the work-in-process, because fundings make-up over one-quarter of the PR's received in PMRNA. The time saved from eliminating the Committee review is not just the time that the PR spends in Committee. The time saved is the preparation of the Committee sheet, the PCO review, two buyer reviews, and one clerical correction service time. This time-savings can be used productively for processing all work-in-process. So the change in one network can influence the completion times of all the networks. Table 9 is the T-test which verifies that the difference is statistically significant.

TABLE 9
Change in Funding Procedures

	<u>With Review</u>	<u>Without Review</u>	<u>Difference</u>
Average Contract Cycle Time (hours)	418.8	338.5	
Standard Deviation of Means (10 runs)	17.7	12.5	
T-Test Results			
T-calculated			11.7188 (X)
T-critical			1.833
F-test			Passed

Conclusion: There is a statistically significant difference between these two means.

This experiment demonstrates the power of this management tool. Eliminating the Committee review of funding actions would obviously reduce the contracting cycle time for funding actions, but predicting the effect of this change on other actions is very difficult to forecast without a model.

Summary

This chapter reviewed and analyzed the results of the study. A review and analysis of the data collection, the verification and validation of the model, and a description and analysis of the research experimentation was presented. Chapter V summarizes the study, presents conclusions, and makes recommendations for future research.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of the study was to develop a model of the contracting cycle of a contracting organization. The model can be used to predict the effect of changes to the organization, procedures, and workload on the contracting cycle time. The Directorate of R&D Contracting, Aeronautical Systems Division, Air Force Systems Command, located at Wright-Patterson Air Force Base, Ohio was selected as the contracting organization to model. R&D Contracting was selected from the many contracting organizations at Wright-Patterson Air Force Base because they are process-oriented; thousands of purchase requests (PR) follow the same procedures. An improvement in the contracting process in R&D Contracting may have a permanent effect on the contracting cycle time.

To construct the model, data was collected on the contracting procedures used in R&D Contracting. Detailed procedures were ascertained on twenty-eight different contracting networks. These networks ranged from the unilateral administrative notice to the ten million dollar competitive procurement. Service times for performing the activities required by the contracting procedures were

collected from estimates provided by experienced personnel in R&D Contracting. Three estimates were provided by each expert on each activity. The first estimate was the normal or average time to perform the activity. The second estimate was the optimistic or shorter-than-average time that an activity would take to perform if there were less problems than usual. The last estimate of each activity was the pessimistic or longer-than-normal time that an activity would take to perform if there were many problems encountered. From these estimates a distribution, or range of times, was computed on each activity.

The model was constructed using the Q-GERT simulation language. Q-GERT is based on the PERT method of determining the time that a project will be completed. Q-GERT improves on PERT by using a distribution of service times instead of converting the estimated times into one service time. Q-GERT also incorporates queuing which permits a more realistic assessment of the completion times of work flowing through the system, because work can be stopped in queues, in-baskets, if a server in the system is busy performing other work. Q-GERT has been used to analyze systems similar to R&D Contracting.

Findings

After the model was constructed, it was tested for

accuracy. The PR's received by a branch of R&D Contracting in FY82 were replicated by the model to determine whether the output of the model would imitate the actual contracting cycle times. The management information system, DATA-CEN, of R&D Contracting provided a list of the PR's received in FY82, and the contracting cycle time of those PR's. The model successfully imitated the contracting cycle time of the competitive PR's and the administrative PR's. The model appeared to overestimate the contracting cycle times for the sole source PR's and for the contract modifications. The DATA-CEN system underestimates the contracting cycle times for contract modifications because most contract modification PR's are not received until the middle of the contracting cycle, so the modeled contracting cycle times for contract modifications may be accurate.

The modeled contracting cycle times for sole source PR's were definitely higher than actuals. Fortunately, this group has the smallest number of PR's, so the total effect on the model was minimized. The overestimation by the model is probably based on the difference between the method specified by the written procedures, and the method actually used in processing sole source PR's.

The model was used to perform four experiments to demonstrate the potential of the model as a management tool. Research question 1 was to determine the effect of varying

the buyer-to-clerk ratio on the contracting cycle time. Three tests were run using: (1) two buyers-per-clerk, (2) 2.4 buyers-per-clerk, and (3) 3.4 buyers-per-clerk. The results were that there was little change in the total contracting cycle time. Server utilization of the clerk increased from 47% to 81%. The model predicts that there would be little saving to the contracting cycle time if the workload for each clerk was reduced, and there would be no increase in the contracting cycle if the workload for each clerk were increased up to the tested maximum of three buyers and a PCO.

Research question 2 was to determine the optimum level of buying work for a PCO with three buyers to sign for. Five different worklevels were tested, 20%, 30%, 40%, 50%, and 60% of a journeyman buyer's workload. The result was that reducing the PCO's workload below the standard 40% did not change the average contracting cycle time significantly, but increasing the PCO's buying workload above the standard 40% caused a significant lengthening to the contracting cycle time. Since the PCO performs services on every PR, a PCO with a big backlog of work delays all the PR's. The PCO is a potential bottleneck in the contracting process, so the PCO's workload should be monitored by management.

Research question 3 was to determine the point where a small increase in workload would lead to a large increase in the average contracting cycle time. That point is when the

modeled group attempts to perform more than 35% of the branch's workload. If the workload for this group was reduced from the standard 40% to 35%, the savings in the average contracting cycle time would be 16%.

Research question 4 was to demonstrate a powerful use for the model of answering 'what if' questions on the contracting procedures. The 'what if' question demonstrated was - what if committee reviews were eliminated on fundings. The result of this change in the model was a reduction in the average contracting cycle time of 19%. Because there are so many fundings in PMRNA, this small change in procedures can lead to a big reduction in the average contracting cycle time for all networks.

Conclusions

Managers make many decisions which effect the contracting cycle time. Before making a decision, the manager should consider the cost or benefits which would accrue to the contracting cycle time. Predicting the effects of a decision is difficult because of the complexity of the contracting procedures. Measuring the effects of a change after the decision has been implemented is often difficult, if not impossible, because there is usually more than one change to the inputs, procedures, or resources in any time period; the workload changes, the experience level

of the buying personnel changes, and contracting procedures change frequently.

Modeling is a technique for predicting the effect of change. The model developed for this study attempted to incorporate many of the variables which compose the contracting process in R&D Contracting. The model is very detailed (see Appendix C). The verification, validation, and research experimentation of this study, demonstrate that the model can imitate the contracting process and have many valuable uses as a management tool.

In the past, managers have either had to ignore a decision's impact on the contracting cycle, or gauge a decision's impact on the contracting cycle on their experience. The prediction of the effect of a decision has been an art. The use of a model introduces science into this area of decision-making. A model cannot replace the manager in decision-making, but a model can provide the manager with valuable information upon which to make good decisions on issues which effect the contracting cycle time.

Recommendations for Future Research

This model can be improved with a relatively small amount of additional work. Modeling is an iterative process. A system is examined, data collected, a model constructed and tested. The test reveals areas where the

model can be improved. The second iteration is where the system is re-examined in order to solve the deficiencies in the model. More iterations may be required. The modeler must decide when the model is sufficiently perfected to suit his needs.

The needs of the contracting manager is for a management tool which can be used to predict the effect of changes to procedures, organizational structure, and workload on the contracting cycle. The model can do that now. The issue is whether the model's predictions are sufficiently accurate, and whether management has sufficient faith in the model's ability to predict the effect of change. Additional research could improve the accuracy of the model's predictions, and provide another demonstration of the model's ability to accurately predict the future by using the model to predict the past of another branch of R&D Contracting.

Additional research should examine the discrepancy between the actual results and the modeled results of the sole source networks. The networks may need to be restructured to reflect the procedures actually used in R&D Contracting if these procedures differ from the formal written procedures. This restructuring may require a limited amount of data collection on service times.

Data should be collected on the point in the contracting cycle of the contract modification when the PR is received.

The model could be easily modified to collect statistics at that point to aid in the validation of the model.

The First-In, First-Out queuing system of the model should be examined to determine whether a more sophisticated system using a complicated priority system would more realistically simulate the contracting process. During data collection, many buyers, clerks, and PCO's stated that they select items from their in-basket in the following order: (1) items requiring a small amount of work, (2) high priority items, (3) Fast Track PR's, (4) any other pre-award work, (5) post-award administration. The model should be revalidated by modeling another branch of R&D Contracting. A successful validation of a second branch should bolster any decision-maker's faith in the accuracy and applicability of the model to his or her branch, division, or directorate.

The model is bumping against the limits of the Q-GERT language. The model failed to complete its simulation when workload exceeded 100 PR's in process. Another simulation language, such as SLAM, might be examined to determine whether another language might better accommodate this simulation.

Only twenty-eight of the thirty-four networks used in R&D Contracting were modeled. Future researchers should consider adding the other six networks to the model.

Network M1, contract modifications under \$10,000, should definitely be added.

Data on the service times was collected by the subjective technique of asking experienced personnel to estimate the time that is required to perform each service activity. Now that a base as been built, some key service times can be more accurately determined by using an objective work measurement technique, such as self-logging.

APPENDIX A
COMPUTER PROGRAM NET


```

      *I3,*,*,I3,*,*,I3,*,*,I3,*,*,I3,*,*,I3,*,*,I3,
      *,*,I3,*,*)
103  FORMAT(5X,*,*,I3,*,*,I3,*,*,I3,*,*,I3,*,),STEP')
C
      WRITE(10,104) NETWK,STEP
      PRINT 104,NETWK,STEP
104  FORMAT('C',6X,' ***** ',A2,' STEP ',I3,' *****')
C
10  IF(SELECT.EQ.1)THEN
      X=2
      Y=6
      V=7
      W=9
      ENDIF
C
      IF(SELECT.EQ.2)THEN
      X=1
      Y=6
      V=10
      W=11
      ENDIF
C
      IF(SELECT.EQ.3)THEN
      X=1
      Y=6
      V=12
      W=12
      ENDIF
C
      IF(SELECT.EQ.4)THEN
      X=1
      Y=5
      V=12
      W=12
      ENDIF
      IF(SELECT.EQ.4)THEN
      X=1
      Y=3
      V=3
      W=3
      ENDIF
C
      GOTO 26
      PRINT*,*
      PRINT*,*PICK DESTINATIONS (NUMBER)*
      PRINT*,*
      DO 27 J=X,Y
      IF(J.EQ.SELECT)GOTO 17

```

```

PRINT*,J,' ',NAMES(J)
27 CONTINUE
C
DO 28 I=V,W
PRINT*,I,' ',NAMES(I)
28 CONTINUE
C
PRINT*, ' '
29 PRINT*, 'ENTER DESTINATION'
READ*,DEST
IF(COUNT.GT.0)THEN
DO 31 N=1,COUNT
IF(DEST.EQ.ELEM(N))THEN
PRINT*, 'DESTINATIONS ALREADY USED. GOTO TRAFFIC.'
GOTO 10
ENDIF
31 CONTINUE
ENDIF
IF(SELECT.EQ.DEST)THEN
PRINT*, 'YOU ARE COMING FROM ',NAMES(SELECT),
* AND GOING TO ',NAMES(DEST),'. TRY AGAIN.'
GOTO 1
ENDIF
PRINT*, 'FROM ',NAMES(SELECT), ' TO ',NAMES(DEST)
PRINT*, 'OK YES(1) NO(2)'
READ*,AFFIRM
IF(AFFIRM.EQ.2)GOTO 10
C
WRITE(10,109) NAMES(SELECT),NAMES(DEST)
109 FORMAT('C',7X,' ***** FROM ',A10,' TO ',A10)
IF(SELECT.GE.5)THEN
WRITE(1,1.5) LINE+STEP,NUMBER(5,DEST)
105 FORMAT(2X,13.1X,'ATT(1,12,1)=1')
ELSE
HERE=SELECT
IF(HERE.GT.5)HERE=5
WRITE(1,1.6) NUMBER(HERE,DEST)
106 FORMAT(2X,'ATT(1,12,1)=1')
ENDIF
IF(DEST.EQ.5)GOTO 133
WRITE(1,1.7) NAMES(DEST)
PRINT 107,NAMES(DEST)
107 FORMAT('C',7X,' ',A10,' SERVICE TIME ')
C
23 PRINT*, 'COMPUTE? YES(1) NO(2)'
READ*,AFFIRM
IF(AFFIRM.EQ.0)THEN
PRINT*, 'ENTER FACTOR AND PARAMETER'

```

```

READ*,FACTOR,NPARAM
PRINT 105, SERVE(DEST),FACTOR,NPARAM
109 FORMAT(6X,'ATT(*.12,*)=*,F5.2,*, TR(*.12,*)')
PRINT*,*      CK = YES(1) NO(2)*
READ*,AFFIRM
IF(AFFIRM.EQ.2)GOTO 23
WRITE(10,109) SERVE(DEST),FACTOR, NPARAM
C
ELSE
CALL RATIC
PRINT 105, SERVE(DEST),FACTOR, NPARAM
WRITE(10,109) SERVE(DEST),FACTOR,NPARAM
ENDIF
C
133 IF(DEST.EQ.10)THEN
WRITE(10,111)
LAST=LINE+STEP+1
DO 202 C=LINE+STEP+1,LINE+23
WRITE(10,112) LAST
LAST=LAST+1
202 CONTINUE
112 FORMAT(2X,I3,1X,'GOTO 9999')
WRITE(10,113) NETWK
113 FORMAT('C',7X,'END OF ',A2,' NETWORK')
PRINT 110, NETWK
PRINT*,*LAST LINE ALLOCATED = *,LINE+23
PRINT*,*LAST LINE USED = *,LINE+STEP
PRINT*,*DELETE LINES *,LINE+STEP+1,* TO *,LINE+23,*
- FROM GOTO STATEMENT AT START OF NETWORK*
PRINT*,*
PRINT*,*DO YOU WANT PAR LIST WRITTEN TO TAPE10?*
PRINT*,*YES(1) NO(2)*
READ*,AFFIRM
IF(AFFIRM.EQ.1) THEN
PRINT*,*ANSWER YES OR NO TO NEXT QUESTION TO RECEIVE PAR*
CALL RATIC
PRINT*,*PAR TABLE WRITTEN TO TAPE10*
ENDIF
STOP
ELSE
SELECT=DEST
DEST=J
COUNT=COUNT+1
IF(SELECT.GT.4)THEN
PRINT*,*
PRINT*,*
PRINT*,*END OF STEP *,STEP
STEP=STEP+1

```

```

      WRITE(10,111)
      WRITE(10,113)
      PRINT 104,NETWK,STEP
      WRITE(10,104) NETWK,STEP
      WRITE(10,113)
113  FORMAT('C')
111  FORMAT(6X,'GOTO 9999')
      COUNT=0
      ENDIF
C
      IF(COUNT.GT.0)THEN
      ELEM(COUNT)=SELECT
      PRINT*,',',HISTORY'
      DO 115 I=1,COUNT
      PRINT*,',',NAMES(ELEM(I))
115  CONTINUE
      PRINT*,',',
      ENDIF
      ENDIF
C
      GOTO 10
      END
      SUBROUTINE FATIG
      REAL B(3),A(11),C(10),APPLE(10),CARROT(9)
      INTEGER AFFIRM
      COMMON FACTOR,NPARAM
C
      DATA A/1.,.9,.8,.7,.6,.5,.4,.3,.2,.1,0/
      DATA C/1.,1.1,1.2,1.4,1.6,2.,2.5,3.,4.,1000.0/
C
-100 PRINT*,',ENTER NORMAL, OPTIMISTIC, PESSIMISTIC '
      READ*,B(1),B(2),B(3)
      PRINT*,',',B(1),',',B(2),',',B(3)
      IF(B(1).EQ.99)GOTO 1400
      IF(B(1).LT.B(2).OR.B(1).GT.B(3))THEN
      PRINT*,',
      PRINT*,',OUT OF ORDER. REINPUT.'
      PRINT*,',
      GOTO 100
      ENDIF
C
      PRINT*,',
      PRINT*,',OK - YES(1) NO(2)'
      PRINT*,',
      READ*,AFFIRM
      IF(AFFIRM.EQ.2)GOTO 100
C
      FACTOR=B(1)

```



```

C      B(C)=B(2)/FACTOR
      B(3)=B(3)/FACTOR
C
      KOUNT=C
      I=1
1220  IF(B(2).LE.A(I).AND.B(2).GT.A(I+1))GOTO 1230
      I=I+1
      KOUNT=KOUNT+1
      GOTO 1220
C
1230  J=1
1240  IF(B(3).GE.C(J).AND.B(3).LT.C(J+1))GOTO 1300
      J=J+1
      GOTO 1240
C
1300  NFA*AM=(10-KOUNT)+J
      RETURN
C
1400  DO 1500 J=1,10
      APPLE(J) = (A(J)+A(J+1))/2
1500  CONTINUE
C
      DO 3010 I=1,9
      CARROT(I)=(C(I)+C(I+1))/2
      IF(1.E0.9)CARROT(I)=(C(I)+2*C(I))/2
3010  CONTINUE
C
      DO 3030 K=0.9,1
      DO 3040 L=1,9,2
C      WRITE(10,201) K+10+L,APPLE(K+1),CARROT(L)
      WRITE(10,*)'PAR,',K+10+L,',',L,',',APPLE(K+1),',',CARROT(L),''
201  FORMAT('PAR,',2,'1',F6.2,',',F6.2,'')
3040  CONTINUE
3030  CONTINUE
      RETURN
      ENO

```

APPENDIX B

Q-GERT MODEL OF R&D CONTRACTING

GEN,MILLER,STAGE,8,24,1983,0,1,9999,4160,10,,2080,53*
 SEE,10,43131766981101*
 SOU,1,0,1*
 VAS,1,5,CO,0*
 REG,2,1,1*
 REG,3,1,1,F*
 SOU,4,0,1*
 VAS,4,5,CO,1*
 REG,22,1,1*
 SOU,6*
 REG,14*
 QUE,5/BUYER-A*
 QUE,7*
 QUE,8*
 QUE,12/BUYER-B*
 QUE,18/BUYER-C*
 QUE,25/BUYER-D,0,(10)26*
 RES,1/BUYER-D,1,26*
 ALL,26,LWF,1,,25/27,31/33*
 QUE,27*
 REG,28,1,1,A*
 FRE,29,,1,1,26*
 REG,11,1,1,F*
 *
 QUE,37/CLERK-A,(10)38*
 QUE,39*
 QUE,40*
 FRE,41,0,3,1,38*
 RES,3/CLERK-A,1,38*
 ALL,38,,3,,37/38*
 ACT,39,40,AT,44,15/CLERK-A*
 ACT,40,41,AT,63,16/CL-A-BPD*
 ACT,41,49*
 QUE,43/CLERK-B,(10)44*
 QUE,45*
 REG,49,1,1,F*
 ALL,44,,2,,43/45*
 RES,2/CLERK-B,1,44*
 FRE,47,0,2,1,44*
 QUE,46*
 ACT,45,46,AT,44,17/CL-B*
 ACT,46,47,AT,62,18/CL-BPD*
 ACT,47,49*
 *
 QUE,31/PCO,(10)26*

QUE,33*
 REG,34,1,1,A*
 FRE,35,1,1,26*
 REG,24,1,1,F*
 *
 REG,50,1,1,F*
 SIN,51/DISTRIB,1,1,D,I*
 * ATTRIBUTE 6 ASSIGNS BUYER-CLERK RATIO:
 * 6,CO,3 = 2 BUYERS + 1 PCO PER CLEPK
 * 6,CO,2 = 2 BUYERS PER CLERK
 * 6,CO,4 = CLERK B HAS 3 BUYERS + PCO
 * 7,CO,2080 = START-UP TIME OF 2080 HOURS
 VAS,2,1,CO,1,6,CO,3,7,CO,2080.,2,UF,1*
 VAS,3,3,UF,2*
 VAS,51,5,UF,3*
 PAR,10,0.,1.*
 PAR,20,1.,4.40*
 * TO CHANGE WORKLOAD AMOUNT CHANGE PAR,30 CARD AS FOLLOWS:
 * PAR,30,37.5451,.01,.6.63261 20%
 * PAR,30,39.0361,.01,.5.30609 25%
 * PAR,30,25.0301,.01,.4.42174 30%
 * PAR,30,21.4544,.01,.3.79006 35%
 * PAR,30,19.7726,.01,.3.3163 40%
 * PAR,30,16.6867,.01,.2.94783 45%
 * PAR,30,15.0181,.01,.2.65304 50%
 * PAR,30,13.6528,.01,.2.41186 55%
 * PAR,30,12.515,.01,.2.21087 60%
 PAR,30,18.7735,.01,.3.3175*
 MOD,53,22,14*
 MOD,54,14,22*
 ACT,1,1,NO,30,1/NEW-PC*
 ACT,1,2*
 ACT,2,3*
 *
 ACT,3,5,(8)2,A6.EQ.1*
 ACT,3,12,(8)3,A7.EQ.1*
 ACT,3,18,(8)4,A8.EQ.1*
 ACT,3,25,(8)5,A9.EQ.1*
 ACT,3,37,(8)6,A10.EQ.1*
 ACT,3,43,(8)7,A11.EQ.1*
 ACT,3,31,(8)8,A55.EQ.1*
 *
 * TO CHANGE WORKLOAD CHANGE ACT,4,4 AS FOLLOWS:
 * 20% ACT,4,4,CO,10.9091,2/OCTFUN*
 * 25% ACT,4,4,CO,6.72727,2/OCTFUN*
 * 30% ACT,4,4,CO,7.27273,2/OCTFUN*
 * 35% ACT,4,4,CO,5.23377,2/OCTFUN*
 * 40% ACT,4,4,CO,5.45455,2/OCTFUN*

* 45% ACT,4,4,CO,4.84848,2/OCTFUN*
 * 50% ACT,4,4,CO,4.36364,2/OCTFUN*
 * 55% ACT,4,4,CO,3.96694,2/OCTFUN*
 * 60% ACT,4,4,CO,3.63636,2/OCTFUN*
 ACT,4,4,CO,5.45455,2/CCTFUN*
 ACT,4,22*
 ACT,22,2*
 ACT,6,7*
 ACT,7,8,CO,168,53/OCT*
 ACT,8,7,CO,1912,54/NOVSEP*
 *
 ACT,5,11,AT,42,3/BUY-A*
 *
 ACT,12,11,AT,42,9/BUY-B*
 *
 ACT,18,11,AT,42,11/BUY-C*
 *
 ACT,27,28,AT,42,13/BUY-D*
 ACT,28,29*
 ACT,28,11*
 *
 ACT,11,37,(8)1,A12.EQ.1*
 ACT,11,43,(8)2,A13.EQ.1*
 ACT,11,31,(8)3,A14.EQ.1*
 ACT,11,50,AT,51,20/CMMTTEE,,4,A15.EQ.1*
 ACT,11,3,(8)5,A16.EQ.1*
 ACT,11,3,AT,48,5/CNTRCTR,,6,A17.EQ.1*
 ACT,11,3,AT,49,6/JAG,,7,A18.EQ.1*
 ACT,11,3,AT,50,7/TECH-E,,8,A19.EQ.1*
 ACT,11,3,AT,55,9/AUDIT,,9,A20.EQ.1*
 *
 *
 *
 ACT,49,5,(8)1,A21.EQ.1*
 ACT,49,12,(8)2,A22.EQ.1*
 ACT,49,18,(8)3,A26.EQ.1*
 ACT,49,25,(8)4,A27.EQ.1*
 ACT,49,31,(8)5,A23.EQ.1*
 - ACT,49,50,AT,51,20/CMMTTEE,,6,A24.EQ.1*
 ACT,49,51,AT,52,21/DIST,,7,A25.EQ.1*
 ACT,49,3,AT,53,20/REPPG,,8,A26.EQ.1*
 ACT,49,3,AT,49,5/CNTRCTR,,9,A27.EQ.1*
 ACT,49,3,(8)10,A28.EQ.1*
 *
 ACT,33,34,AT,43,19/PCO*
 ACT,34,35*
 ACT,34,24*
 *

ACT,24,5,(8)1,A29.EQ.1*
 ACT,24,12,(8)2,A30.EQ.1*
 ACT,24,18,(8)3,A31.EQ.1*
 ACT,24,25,(8)4,A32.EQ.1*
 ACT,24,37,(8)5,A33.EQ.1*
 ACT,24,43,(8)6,A34.EQ.1*
 ACT,24,3,AT,48,5/CNTRCTP,,7,A35.EQ.1*
 ACT,24,3,(8)8,A36.EQ.1*
 ACT,24,3,AT,54,23/MGT,,9,A37.EQ.1*
 ACT,24,50,AT,51,20/CMMTTEE,,10,A61.EQ.1*

*
 ACT,50,3,(8)11,A38.EQ.1*
 ACT,50,3,AT,54,23/MGT,,2,A39.EQ.1*
 ACT,50,37,(8)3,A40.EQ.1*
 ACT,50,43,(8)4,A41.EQ.1*
 ACT,50,5,(8)5,A45.EQ.1*
 ACT,50,12,(8)6,A46.EQ.1*
 ACT,50,13,(8)7,A47.EQ.1*
 ACT,50,25,(8)8,A59.EQ.1*
 ACT,50,31,(8)9,A60.EQ.1*
 PAR,1,1,,,95,1.05*
 PAR,2,1,,,95,1.15*
 PAR,3,1,,,95,1.3*
 PAR,4,1,,,95,1.5*
 PAR,5,1,,,95,1.8*
 PAR,6,1,,,95,2.25*
 PAR,7,1,,,95,2.75*
 PAR,8,1,,,95,3.5*
 PAR,9,1,,,95,6.*
 PAR,11,1,,,85,1.05*
 PAR,12,1,,,85,1.15*
 PAR,13,1,,,85,1.3*
 PAR,14,1,,,85,1.5*
 PAR,15,1,,,85,1.8*
 PAR,16,1,,,85,2.25*
 PAR,17,1,,,85,2.75*
 PAR,18,1,,,85,3.5*
 PAR,19,1,,,85,6.*
 PAR,21,1,,,75,1.05*
 PAR,22,1,,,75,1.15*
 PAR,23,1,,,75,1.3*
 PAR,24,1,,,75,1.5*
 PAR,25,1,,,75,1.8*
 PAR,26,1,,,75,2.05*
 PAR,27,1,,,75,2.75*
 PAR,28,1,,,75,3.5*
 PAR,29,1,,,75,6.*
 PAR,31,1,,,65,1.05*

PAR,32,1.,.65,1.15*
 PAR,33,1.,.65,1.3*
 PAR,34,1.,.65,1.5*
 PAR,35,1.,.65,1.8*
 PAR,36,1.,.65,2.25*
 PAR,37,1.,.65,2.75*
 PAR,38,1.,.65,3.5*
 PAR,39,1.,.65,6.*
 PAR,41,1.,.55,1.05*
 PAR,42,1.,.55,1.15*
 PAR,43,1.,.55,1.3*
 PAR,44,1.,.55,1.5*
 PAR,45,1.,.55,1.8*
 PAR,46,1.,.55,2.25*
 PAR,47,1.,.55,2.75*
 PAR,48,1.,.55,3.5*
 PAR,49,1.,.55,6.*
 PAR,51,1.,.45,1.05*
 PAR,52,1.,.45,1.15*
 PAR,53,1.,.45,1.3*
 PAR,54,1.,.45,1.5*
 PAR,55,1.,.45,1.8*
 PAR,56,1.,.45,2.25*
 PAR,57,1.,.45,2.75*
 PAR,58,1.,.45,3.5*
 PAR,59,1.,.45,6.*
 PAR,61,1.,.35,1.05*
 PAR,62,1.,.35,1.15*
 PAR,63,1.,.35,1.3*
 PAR,64,1.,.35,1.5*
 PAR,65,1.,.35,1.8*
 PAR,66,1.,.35,2.25*
 PAR,67,1.,.35,2.75*
 PAR,68,1.,.35,3.5*
 PAR,69,1.,.35,6.*
 PAR,71,1.,.25,1.05*
 PAR,72,1.,.25,1.15*
 PAR,73,1.,.25,1.3*
 PAR,74,1.,.25,1.5*
 PAR,75,1.,.25,1.8*
 PAR,76,1.,.25,2.25*
 PAR,77,1.,.25,2.75*
 PAR,78,1.,.25,3.5*
 PAR,79,1.,.25,6.*
 PAR,81,1.,.15,1.05*
 PAR,82,1.,.15,1.15*
 PAR,83,1.,.15,1.3*

PAR,84,1.,.15,1.5*
PAR,85,1.,.15,1.8*
PAR,86,1.,.15,2.25*
PAR,87,1.,.15,2.75*
PAR,88,1.,.15,3.5*
PAR,89,1.,.15,6.*
PAR,91,1.,.05,1.05*
PAR,92,1.,.05,1.15*
PAR,93,1.,.05,1.3*
PAR,94,1.,.05,1.5*
PAR,95,1.,.05,1.8*
PAR,96,1.,.05,2.25*
PAR,97,1.,.05,2.75*
PAR,98,1.,.05,3.5*
PAR,99,1.,.05,6.*
FIN*

APPENDIX C
FORTRAN SUBROUTINE

```

C.....SUB.....
      FUNCTION UF(IFN)
      REAL ATT(64), PACT(28), START, RATIO
      REAL BURDA, BURDB
      INTEGER STEP, PTYPE, K, M, ASSIGN
C      TOTX() = COMPLETION TIME FOR CONTRACTS
C      ITTN() = NUMBER OF COMPLETIONS PER NETWORK
C      SUMSQ() = SUM SQUARE OF COMPLETION TIMES
C
C      CTOTX() = COMPLETIONS FOR ALL RUNS
C      NTOT() = NUMBER OF COMPLETIONS FOR ALL RUNS
C      CSSQ() = SUM SQUARE FOR ALL RUNS
C      CILP = CONFIDENCE INTERVAL - PREDICTION - LOWER
C      CIHP = CONFIDENCE INTERVAL - PREDICTION - UPPER
C      CILM = CONFIDENCE INTERVAL - MEAN - LOWER
C      CIHP = CONFIDENCE INTERVAL - MEAN - UPPER
      COMMON/ GVAP/ NDE, NFBUS(500), NREL(500), NREL2(500),
      INRUN, NRUNS, NTC(500), PARAM(100,4), TBEG, TNOW
      COMMON/ CHRIS/ TOTX(28), ITTN(28), SUMSQ(28), X, CTOTX(28),
      INTJT(28), CSSQ(28)
      DATA PNET/.00722,.03249,.05415,.06137,.06859,.09025,.09747,
      .10469,.12635,.12996,.14079,.14080,.14081,.14440,.14441,
      .15523,.14079,.15625,.153430,.155235,.156318,.156679,.159123,
      .159124,.160650,.169314,.177979,1.0/
      CALL GETAT(ATT)
C
      DO 1107 K=8,63,1
      ATT(K)=3.
1109 CONTINUE
C
C      ***** FOR ASSIGNMENT OF BUYER AND PR TYPE (UF1), OR
C      FOR ASSIGNMENT OF ACTIVITIES (UF2), OR
C      FOR TABULATING NETWORK SINKS (UF3)
C
      GOT3:(1000,2000,3000),IFN
C
C      $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
C
C      ASSIGNMENT OF BUYER AND PR TYPE (UF1)
C
C      ASSIGN BUYER
1000 ASSIGN = INT(UN(20))
      DO 1315 M = 1,4
      IF (ASSIGN.EQ.M) ATT(4) = M
1015 CONTINUE
C
C      ***** ASSIGNMENT OF BUYER-CLERK RATIO *****
      IF (TNOW.EQ.0.0.AND.ATT(5).NE.1) THEN

```

```

      IF(ATT(6).EQ.3) THEN
        RATIO=2.
        BURDA=1.4
        BURDB=0.
      ENDIF
      IF(ATT(6).EQ.2) THEN
        RATIO=3.
        BURDA=0.
        BURDB=0.429
      ENDIF
      IF(ATT(6).EQ.4) THEN
        RATIO=0.
        BURDA=0.
        BURDB=0.
      ENDIF
C     **** ASSIGN STARTING CONDITIONS ****
      START=ATT(7)
      ENDIF
C     ***** ASSIGN PR TYPE (UF1) *****
      PR=UN(1)
      M=1
1077 IF(PR.LE.PNET(M)) THEN
        UF=M
        GOTO 1079
      ENDIF
      M=M+1
      GOTO 1077
1079 IF(ATT(5).EQ.1) UF=17
C
      CALL PUTAT(ATT)
      RETURN
C
C *****
C
C     ***** ASSIGNMENT OF ACTIVITIES (UF2) *****
C
2000 PRTYPE = NINT(ATT(2))
      STEP = NINT(ATT(1))
      ATT(6)=0.
      ATT(7)=0.
C
C     *** SEND TRANSACTION TO APPROPRIATE PR TYPE ***
C
      GOTJ(1,42,83,124,165,206,247,289,330,371,412,453,494,535,
      *576,618,659,700,729,758,787,816,845,874,907,936,939,
      *968),PRTYPE
C
C_     **** C2 NETWORK ****

```

```

1 GOTO( 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,
* 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25,
* 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37,
* 39, 39, 40, 41),STEP
C      **** C2 STEP 1 ****
C      **** FROM TRAFFIC      TO PCO
2 ATT(58)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PCO      TO BUYER
ATT(29)=1
C      BUYER      SERVICE TIME
ATT(42)= 10.00* TR(44)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 6.00* TR(33)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C      **** C2 STEP 2 ****
C
C      **** FROM TRAFFIC      TO BUYER
3 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(56)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C      **** C2 STEP 3 ****
C
C      **** FROM TRAFFIC      TO BUYER
- 4 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(56)
C      **** FROM PCO      TO TRAFFIC
ATT(35)=1
GOTO 9999

```

```

C
C      ***** C2 STEP   4 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C      5 ATT( 5)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(54)
C      ***** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.00* TR(56)
C      ***** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      ***** C2 STEP   5 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C      6 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= .50* TR(46)
C      ***** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .30* TR( 6)
C      ***** FROM PCO      TO CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .30* TR( 1)
C      ***** FROM CLERK      TO REPRODUCTION
C      ATT(26)=1
C      REPRODUCTION SERVICE TIME
C      ATT(53)= 16.00* TR(54)
C      GOTO 9999
C
C      ***** C2 STEP   6 *****
C
C      ***** FROM REPRODUCTION TO CLERK
C      7 ATT(10)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.00* TR(26)
C      ***** FROM CLERK      TO CONTRACTOR
C      ATT(27)=1
C      CONTRACTOR SERVICE TIME
C      ATT(45)=176.00* TR(24)
C      GOTO 9999
C
C      ***** C2 STEP   7 *****

```

```

C
C      **** FROM CONTRACTOR   TO BUYER
C 8 ATT( 6)=1
C      BUYER           SERVICE TIME
C      ATT(42)= 3.00* TR(33)
C      **** FROM BUYER       TO TECH.EVAL
C      ATT(19)=1
C      TECH.EVAL        SERVICE TIME
C      ATT(50)=176.00* TR(43)
C      GOTO 9999
C
C      **** C2 STEP   8 ****
C
C      **** FROM TECH.EVAL   TO BUYER
C 9 ATT( 6)=1
C      BUYER           SERVICE TIME
C      ATT(42)= 4.00* TR(54)
C      **** FROM BUYER       TO CLERK
C      ATT(12)=1
C      CLERK           SERVICE TIME
C      ATT(44)= .50* TR(46)
C      **** FROM CLERK       TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** C2 STEP   9 ****
C
C      **** FROM TRAFFIC     TO BUYER
C 10 ATT( 6)=1
C      BUYER           SERVICE TIME
C      ATT(42)= 6.00* TR(36)
C      **** FROM BUYER       TO PCO
C      ATT(14)=1
C      PCO             SERVICE TIME
C      ATT(43)= .80* TR(33)
C      **** FROM PCO         TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      **** C2 STEP  10 ****
C
C      **** FROM TRAFFIC     TO BUYER
C 11 ATT( 6)=1
C      BUYER           SERVICE TIME
C      ATT(42)= 3.00* TP(33)
C      **** FROM BUYER       TO CLERK
C      ATT(12)=1
C      CLERK           SERVICE TIME

```

```

ATT(44)= .80* TR(35)
C      **** FROM CLERK          TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR    SERVICE TIME
ATT(48)= 80.00* TR(24)
GOTO 9999

C
C      **** C2 STEP  11 ****
C
C      **** FROM CONTRACTOR    TO BUYER
12 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 10.00* TR(25)
C      **** FROM BUYER        TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 5.00* TR(45)
C      **** FROM CLERK        TO TRAFFIC
ATT(29)=1
GOTO 9999

C
C      **** C2 STEP  12 ****
C
C      **** FROM TRAFFIC      TO BUYER
13 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(58)
C      **** FROM BUYER        TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 1.00* TR(48)
C      **** FROM CLERK        TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** C2 STEP  13 ****
C
C      **** FROM TRAFFIC      TO BUYER
14 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER        TO PCC
ATT(14)=1
C      PCC            SERVICE TIME
ATT(43)= 1.50* TR(33)
C      **** FROM PCC          TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      **** C2 STEP 14 ****
C
C      **** FROM TRAFFIC      TO BUYER
15 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(46)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** C2 STEP 15 ****
C
C      **** FROM TRAFFIC      TO BUYER
16 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(56)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(67)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(53)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)= 80.00* TR(54)
GOTO 9999

C
C      **** C2 STEP 16 ****
C
C      **** FROM CONTRACTOR      TO BUYER
17 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(31)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME

```



```

ATT(44)= .30* TR( 1)
C      **** FROM CLERK          TO REPRODUCTION
ATT(26)=1
C      REPRODUCTION SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999
C
C      **** C2 STEP  17 ****
C
C      **** FROM REPRODUCTION TO CLERK
18 ATT(10)=1
C      CLERK          SERVICE TIME
ATT(44)= 2.00* TR(24)
C      **** FROM CLERK          TO DISTRIBUTION
ATT(25)=1
C      DISTRIBUTION SERVICE TIME
ATT(52)= 12.00* TR(35)
GOTO 9999
19 GOTO 9999
20 GOTO 9999
21 GOTO 9999
22 GOTO 9999
23 GOTO 9999
24 GOTO 9999
25 GOTO 9999
26 GOTO 9999
27 GOTO 9999
28 GOTO 9999
29 GOTO 9999
30 GOTO 9999
31 GOTO 9999
32 GOTO 9999
33 GOTO 9999
34 GOTO 9999
35 GOTO 9999
36 GOTO 9999
37 GOTO 9999
38 GOTO 9999
39 GOTO 9999
40 GOTO 9999
41 GOTO 9999
C      END OF C2 NETWORK
C      **** C3 NETWORK ****
42 GOTO( 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54,
* 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66,
* 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78,
* 79, 80, 81, 82),STEP
C      **** C3 STEP  1 ****

```

```

C      **** FROM TRAFFIC      TO PCO
43 ATT(58)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PCO      TO BUYER
ATT(29)=1
C      BUYER      SERVICE TIME
ATT(42)= 10.00* TR(44)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 6.00* TR(34)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** C3 STEP 2 ****
C
C      **** FROM TRAFFIC      TO BUYER
44 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(56)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** C3 STEP 3 ****
C
C      **** FROM TRAFFIC      TO BUYER
45 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(48)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(56)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** C3 STEP 4 ****
C
C      **** FROM TRAFFIC      TO BUYER
46 ATT( 6)=1

```

```

C          BUYER          SERVICE TIME
ATT(42)= 1.00* TP(54)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 1.00* TP(56)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          ***** C3 STEP 5 *****
C
C          **** FROM TRAFFIC          TO BUYER
47 ATT(6)=1
C          BUYER          SERVICE TIME
ATT(42)= .50* TP(46)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= .30* TP(4)
C          **** FROM PCC          TO CLERK
ATT(33)=1
C          CLERK          SERVICE TIME
ATT(44)= .30* TP(1)
C          **** FROM CLERK          TO REPRODUCTION
ATT(25)=1
C          REPRODUCTION SERVICE TIME
ATT(53)= 17.00* TP(54)
GOTO 9999

C
C          ***** C3 STEP 6 *****
C
C          **** FROM REPRODUCTION TO CLERK
48 ATT(19)=1
C          CLERK          SERVICE TIME
ATT(44)= 1.00* TP(29)
C          **** FROM CLERK          TO CONTRACTOR
ATT(27)=1
C          CONTRACTOR SERVICE TIME
ATT(44)= 175.00* TP(24)
GOTO 9999

C
C          ***** C3 STEP 7 *****
C
C          **** FROM CONTRACTOR TO BUYER
49 ATT(6)=1
C          BUYER          SERVICE TIME
ATT(42)= 13.00* TP(33)

```

```

C      **** FROM BUYER      TO TECH.EVAL
C      ATT(19)=1
C      TECH.EVAL      SERVICE TIME
C      ATT(50)=179.00* TR(43)
C      GOTO 9999
C
C      **** C3 STEP      8 ****
C
C      **** FROM TECH.EVAL      TO BUYER
50 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 4.00* TR(54)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.50* TR(46)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** C3 STEP      9 ****
C
C      **** FROM TRAFFIC      TO BUYER
51 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 5.00* TR(56)
C      **** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= 1.50* TR(45)
C      **** FROM PCO      TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      **** C3 STEP     10 ****
C
C      **** FROM TRAFFIC      TO BUYER
52 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 3.00* TR(53)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.50* TR(35)
C      **** FROM CLERK      TO CONTRACTOR
C      ATT(27)=1
C      CONTRACTOR      SERVICE TIME
C      ATT(43)= 1.00* TR(24)

```

```

C      GOTO 9999
C
C      **** C3 STEP 11 ****
C
C      **** FROM CONTRACTOR    TO BUYER
53 ATT( 6)=1
C      BUYER          SERVICE TIME
C      ATT(42)=  6.00* TR(24)
C      **** FROM BUYER        TO CLERK
C      ATT(12)=1
C      CLERK          SERVICE TIME
C      ATT(44)=  6.00* TR(34)
C      **** FROM CLERK        TO TRAFFIC
C      ATT(26)=1
C      GOTO 9999
C
C      **** C3 STEP 12 ****
C
C      **** FROM TRAFFIC      TO BUYER
54 ATT( 6)=1
C      BUYER          SERVICE TIME
C      ATT(42)=  1.00* TR(56)
C      **** FROM BUYER        TO CLERK
C      ATT(12)=1
C      CLERK          SERVICE TIME
C      ATT(44)=  1.00* TR(46)
C      **** FROM CLERK        TO TRAFFIC
C      ATT(26)=1
C      GOTO 9999
C
C      **** C3 STEP 13 ****
C
C      **** FROM TRAFFIC      TO BUYER
55 ATT( 6)=1
C      BUYER          SERVICE TIME
C      ATT(42)=  1.00* TR(54)
C      **** FROM BUYER        TO PC1
C      ATT(14)=1
C      PC1            SERVICE TIME
C      ATT(43)=  1.00* TR(34)
C      **** FROM PC1          TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      **** C3 STEP 14 ****
C
C      **** FROM TRAFFIC      TO BUYER
56 ATT( 6)=1

```

```

C          BUYER          SERVICE TIME
C      ATT(42)= 1.00* TR(55)
C          **** FROM BUYER          TO CLERK
C      ATT(12)=1
C          CLERK          SERVICE TIME
C      ATT(44)= 1.00* TR(46)
C          **** FROM CLERK          TO TRAFFIC
C      ATT(29)=1
C      GOTO 9999
C
C          **** C3 STEP 15 ****
C
C          **** FROM TRAFFIC          TO BUYER
C 57 ATT( 5)=1
C          BUYER          SERVICE TIME
C      ATT(42)= .50* TR(56)
C          **** FROM BUYER          TO PCO
C      ATT(14)=1
C          PCO          SERVICE TIME
C      ATT(43)= .30* TR(67)
C          **** FROM PCO          TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C          **** C3 STEP 16 ****
C
C          **** FROM TRAFFIC          TO BUYER
C 58 ATT( 5)=1
C          BUYER          SERVICE TIME
C      ATT(42)= .50* TR( 6)
C          **** FROM BUYER          TO JAG
C      ATT(18)=1
C          JAG          SERVICE TIME
C      ATT(49)= 24.00* TR(36)
C      GOTO 9999
C
C          **** C3 STEP 17 ****
C
C          **** FROM JAG          TO BUYER
C 59 ATT( 5)=1
C          BUYER          SERVICE TIME
C      ATT(42)= .50* TR( 6)
C          **** FROM BUYER          TO TRAFFIC
C      ATT(15)=1
C      GOTO 9999
C
C          **** C3 STEP 18 ****
C

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```

C      **** FROM TRAFFIC      TO BUYER
60 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TP(53)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TP(46)
C      **** FROM CLERK      TO TRAFFIC
ATT(25)=1
GOTO 9999

C
C      **** C3 STEP 19 ****
C
C      **** FROM TRAFFIC      TO BUYER
61 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .20* TP(35)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TP(33)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TP(53)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(43)= 50.00* TP(54)
GOTO 9999

C
C      **** C3 STEP 20 ****
C
C      **** FROM CONTRACTOR      TO BUYER
62 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TP(74)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TP(31)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TP( 1)
C      **** FROM CLERK      TO REPRODUCTION
ATT(25)=1

```

```

C          REPRODUCTION SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999

C
C          **** C3 STEP 21 ****
C
C          **** FROM REPRODUCTION TO CLERK
63 ATT(10)=1
C          CLERK          SERVICE TIME
ATT(44)= 2.00* TR(24)
C          **** FROM CLERK          TO DISTRIBUTION
ATT(25)=1
C          DISTRIBUTION SERVICE TIME
ATT(52)= 10.00* TR(35)
GOTO 9999
64 GOTO 9999
65 GOTO 9999
66 GOTO 9999
67 GOTO 9999
68 GOTO 9999
69 GOTO 9999
70 GOTO 9999
71 GOTO 9999
72 GOTO 9999
73 GOTO 9999
74 GOTO 9999
75 GOTO 9999
76 GOTO 9999
77 GOTO 9999
78 GOTO 9999
79 GOTO 9999
80 GOTO 9999
81 GOTO 9999
82 GOTO 9999

C          END OF C3 NETWORK
C          **** C4 NETWORK ****
83 GOTO( 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95,
* 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107,
* 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119,
* 120, 121, 122, 123), STEP
C          **** C4 STEP 1 ****
C          **** FROM TRAFFIC          TO PCO
84 ATT(58)=1
C          PCO          SERVICE TIME
ATT(43)= .30* TR( 6)
C          **** FROM PCO          TO BUYER
ATT(26)=1
C          BUYER          SERVICE TIME

```



```

      ATT(42)= 12.00* TR(33)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= 6.00* TR(24)
C      **** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTO 9999
C
C      **** C4 STEP    2 ****
C
C      **** FROM TRAFFIC        TO BUYER
85 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 2.00* TR(54)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= 1.00* TR(56)
C      **** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTO 9999
C
C      **** C4 STEP    3 ****
C
C      **** FROM TRAFFIC        TO BUYER
86 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= .50* TR(45)
C      **** FROM BUYER          TO PCO
      ATT(14)=1
C      PCO          SERVICE TIME
      ATT(43)= 1.00* TR(25)
C      **** FROM PCO          TO TRAFFIC
      ATT(36)=1
      GOTO 9999
C
C      **** C4 STEP    4 ****
C
C      **** FROM TRAFFIC        TO BUYER
87 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 1.00* TR(34)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= 1.00* TR(36)
C      **** FROM CLERK          TO TRAFFIC

```

```

C      **** C4 STEP    5 ****
C
C      ***** FROM TRAFFIC          TO BUYER
68 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)=    .50* TR(46)
C      ***** FROM BUYER          TO PCO
ATT(14)=1
C      PCO          SERVICE TIME
ATT(43)=    .30* TR( 6)
C      ***** FROM PCO          TO TRAFFIC
ATT(36)=1
GOTO 9999
C
C      **** C4 STEP    6 ****
C
C      ***** FROM TRAFFIC          TO BUYER
89 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)=    .50* TR( 6)
C      ***** FROM BUYER          TO JAG
ATT(15)=1
C      JAG          SERVICE TIME
ATT(49)= 24.00* TR(35)
GOTO 9999
C
C      **** C4 STEP    7 ****
C
C      ***** FROM JAG          TO BUYER
90 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)=    .50* TR( 6)
C      ***** FROM BUYER          TO TRAFFIC
ATT(15)=1
GOTO 9999
C
C      **** C4 STEP    8 ****
C
C      ***** FROM TRAFFIC          TO BUYER
91 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)=    1.00* TR(84)
C      ***** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME

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```

C      ATT(44)= .50* TR(46)
C      **** FROM CLERK          TO TRAFFIC
C      ATT(25)=1
C      GOTO 9999
C
C      **** C4 STEP   9 ****
C
C      **** FROM TRAFFIC        TO BUYER
C 92 ATT( 5)=1
C      BUYER          SERVICE TIME
C      ATT(42)= .50* TR(46)
C      **** FROM BUYER          TO PCO
C      ATT(14)=1
C      PCO            SERVICE TIME
C      ATT(43)= .50* TR(46)
C      **** FROM PCO            TO CLERK
C      ATT(33)=1
C      CLERK          SERVICE TIME
C      ATT(44)= .30* TR( 1)
C      **** FROM CLERK          TO REPRODUCTION
C      ATT(26)=1
C      REPRODUCTION SERVICE TIME
C      ATT(53)= 15.00* TR(54)
C      GOTO 9999
C
C      **** C4 STEP  10 ****
C
C      **** FROM REPRODUCTION TO CLERK
C 93 ATT(10)=1
C      CLERK          SERVICE TIME
C      ATT(44)= 1.00* TR(26)
C      **** FROM CLERK          TO CONTRACTOR
C      ATT(27)=1
C      CONTRACTOR    SERVICE TIME
C      ATT(48)= 175.00* TR(24)
C      GOTO 9999
C
C      **** C4 STEP  11 ****
C
C      **** FROM CONTRACTOR     TO BUYER
C 94 ATT( 6)=1
C      BUYER          SERVICE TIME
C      ATT(42)= 3.00* TR(33)
C      **** FROM BUYER          TO TECH.EVAL
C      ATT(19)=1
C      TECH.EVAL      SERVICE TIME
C      ATT(53)= 175.00* TR(43)
C      GOTO 9999

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C
C      ***** C4 STEP 12 *****
C
C      ***** FROM TECH.EVAL      TO BUYER
95 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 4.00* TR(54)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(46)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C      ***** C4 STEP 13 *****
C
C      ***** FROM TRAFFIC      TO BUYER
96 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 10.00* TR(64)
C      ***** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .80* TR(35)
C      ***** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999
C
C      ***** C4 STEP 14 *****
C
C      ***** FROM TRAFFIC      TO BUYER
97 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 4.00* TR(53)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(35)
C      ***** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)= 30.00* TR(24)
GOTO 9999
C
C      ***** C4 STEP 15 *****
C
C      ***** FROM CONTRACTOR      TO BUYER

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```

98 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 10.00* TR(24)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 5.00* TR(25)
C      **** FROM CLERK      TO TRAFFIC
ATT(26)=1
GOTO 9499

C
C      **** C4 STEP 16 ****
C
C      **** FROM TRAFFIC      TO BUYER
99 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(24)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(40)
C      **** FROM CLERK      TO TRAFFIC
ATT(26)=1
GOTO 9999

C
C      **** C4 STEP 17 ****
C
C      **** FROM TRAFFIC      TO BUYER
100 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(24)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.40* TR(35)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** C4 STEP 18 ****
C
C      **** FROM TRAFFIC      TO BUYER
101 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(25)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME

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```

C      ATT(44)= 1.00* TR(46)
C      ***** FROM CLERK          TO TRAFFIC
C      ATT(22)=1
C      GOTO 9999
C
C      ***** C4 STEP 19 *****
C
C      ***** FROM TRAFFIC        TO BUYER
C 102 ATT( 5)=1
C      BUYER          SERVICE TIME
C      ATT(42)= .50* TR(56)
C      ***** FROM BUYER          TO PCO
C      ATT(14)=1
C      PCO            SERVICE TIME
C      ATT(43)= .30* TR(67)
C      ***** FROM PCO            TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      ***** C4 STEP 20 *****
C
C      ***** FROM TRAFFIC        TO BUYER
C 103 ATT( 5)=1
C      BUYER          SERVICE TIME
C      ATT(42)= .50* TR( 5)
C      ***** FROM BUYER          TO JAG
C      ATT(13)=1
C      JAG            SERVICE TIME
C      ATT(45)= 24.00* TR(36)
C      GOTO 9999
C
C      ***** C4 STEP 21 *****
C
C      ***** FROM JAG            TO BUYER
C 104 ATT( 6)=1
C      BUYER          SERVICE TIME
C      ATT(42)= .50* TR( 6)
C      ***** FROM BUYER          TO TRAFFIC
C      ATT(16)=1
C      GOTO 9999
C
C      ***** C4 STEP 22 *****
C
C      ***** FROM TRAFFIC        TO BUYER
C 105 ATT( 6)=1
C      BUYER          SERVICE TIME
C      ATT(42)= 1.00* TR(69)
C      ***** FROM BUYER          TO CLERK

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C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .50* TP(46)
C      ***** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999

C
C      ***** C4 STEP 23 *****
C
C      ***** FROM TRAFFIC      TO BUYER
106 C      ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= .30* TP(33)
C      ***** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .40* TP(33)
C      ***** FROM PCO      TO CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.00* TP(33)
C      ***** FROM CLERK      TO CONTRACTOR
C      ATT(27)=1
C      CONTRACTOR SERVICE TIME
C      ATT(45)= 80.00* TP(34)
C      GOTO 9999

C
C      ***** C4 STEP 24 *****
C
C      ***** FROM CONTRACTOR TO BUYER
107 C      ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TP(34)
C      ***** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .30* TP(31)
C      ***** FROM PCO      TO CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .30* TP( 1)
C      ***** FROM CLERK      TO REPRODUCTION
C      ATT(26)=1
C      REPRODUCTION SERVICE TIME
C      ATT(53)= 16.00* TP(34)
C      GOTO 9999

C
C      ***** C4 STEP 25 *****

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C
C      **** FROM REPRODUCTION TO CLERK
108 ATT(10)=1
C      CLERK          SERVICE TIME
      ATT(44)= 2.00* TR(24)
C      **** FROM CLERK          TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTO 9999
109 GOTO 9999
110 GOTO 9999
111 GOTO 9999
112 GOTO 9999
113 GOTO 9999
114 GOTO 9999
115 GOTO 9999
116 GOTO 9999
117 GOTO 9999
118 GOTO 9999
119 GOTO 9999
120 GOTO 9999
121 GOTO 9999
122 GOTO 9999
123 GOTO 9999
C      END OF C4 NETWORK
C      **** C5 NETWORK ****
124 GOTO(105,106,107,108,109,130,131,132,133,134,135,136,
      *137,138,139,140,141,142,143,144,145,146,147,148,
      *149,150,151,152,153,154,155,156,157,158,159,160,
      *161,162,163,164),STEP
C      **** C5 STEP 1 ****
C      **** FROM TRAFFIC          TO PCC
125 ATT(53)=1
C      PCC          SERVICE TIME
      ATT(43)= .50* TR(46)
C      **** FROM PCC          TO BUYER
      ATT(28)=1
C      BUYER          SERVICE TIME
      ATT(42)= 16.00* TR(53)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= 7.00* TR(13)
C      **** FROM CLERK          TO TRAFFIC
      ATT(26)=1
      GOTO 9999
C

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```

C      ***** C5 STEP 2 *****
C
C      ***** FROM TRAFFIC      TO BUYER
126 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(54)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(55)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      ***** C5 STEP 3 *****
C
C      ***** FROM TRAFFIC      TO BUYER
127 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(48)
C      ***** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(27)
C      ***** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      ***** C5 STEP 4 *****
C
C      ***** FROM TRAFFIC      TO BUYER
128 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(55)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      ***** C5 STEP 5 *****
C
C      ***** FROM TRAFFIC      TO BUYER
129 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)

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```

C      **** FROM BUYER          TO PCC
C      ATT(14)=1
C      PCC          SERVICE TIME
C      ATT(43)= .30* TR( 6)
C      **** FROM PCC          TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      **** CS STEP    6 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 130 ATT( 6)=1
C      BUYER          SERVICE TIME
C      ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO JAG
C      ATT(18)=1
C      JAG          SERVICE TIME
C      ATT(49)= 24.00* TR(35)
C      GOTO 9999
C
C      **** CS STEP    7 ****
C
C      **** FROM JAG          TO BUYER
C 131 ATT( 6)=1
C      BUYER          SERVICE TIME
C      ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO TRAFFIC
C      ATT(18)=1
C      GOTO 9999
C
C      **** CS STEP    8 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 132 ATT( 6)=1
C      BUYER          SERVICE TIME
C      ATT(42)= 1.00* TR(58)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK          SERVICE TIME
C      ATT(44)= .50* TR(46)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(25)=1
C      GOTO 9999
C
C      **** CS STEP    9 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 133 ATT( 6)=1

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```

C          BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= .50* TR(45)
C          **** FROM PCC          TO COMMITTEE
ATT(51)=1
C          COMMITTEE          SERVICE TIME
ATT(51)= 14.00* TR(56)
C          **** FROM COMMITTEE          TO TRAFFIC
ATT(39)=1
GOTO 9999

C
C          **** CS STEP 10 ****
C
C          **** FROM TRAFFIC          TO BUYER
134 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 3.00* TR(65)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 1.00* TR(66)
C          **** FROM CLERK          TO TRAFFIC
ATT(26)=1
GOTO 9999

C
C          **** CS STEP 11 ****
C
C          **** FROM TRAFFIC          TO BUYER
135 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(64)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= .50* TR(46)
C          **** FROM PCC          TO CLERK
ATT(33)=1
C          CLERK          SERVICE TIME
ATT(44)= .30* TR( 1)
C          **** FROM CLERK          TO REPRODUCTION
ATT(26)=1
C          REPRODUCTION SERVICE TIME
ATT(53)= 15.00* TR(14)
GOTO 9999
C

```

```

C      ***** C5 STEP 12 *****
C
C      ***** FROM REPRODUCTION TO CLERK
136 ATT(13)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(26)
C      ***** FROM CLERK      TO BUYER
ATT(21)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(54)
C      ***** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      ***** C5 STEP 13 *****
C
C      ***** FROM TRAFFIC      TO CLERK
137 ATT(17)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(54)
C      ***** FROM CLERK      TO BUYER
ATT(21)=1
C      BUYER      SERVICE TIME
ATT(42)= .40* TR(54)
C      ***** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(35)
C      ***** FROM PCO      TO CONTRACTOR
ATT(35)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)=176.00* TR(24)
GOTO 9999

C
C      ***** C5 STEP 14 *****
C
C      ***** FROM CONTRACTOR      TO BUYER
138 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(33)
C      ***** FROM BUYER      TO TECH.EVAL
ATT(15)=1
C      TECH.EVAL      SERVICE TIME
ATT(50)=176.00* TR(43)
GOTO 9999

C
C      ***** C5 STEP 15 *****
C

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```

C      **** FROM TECH.EVAL      TO BUYER
139 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 4.00* TF(54)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TF(46)
C      **** FROM CLERK      TO TRAFFIC
ATT(26)=1
GOTO 9999

C
C      **** C5 STEP 16 ****
C
C      **** FROM TRAFFIC      TO BUYER
140 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 6.00* TF(57)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TF(26)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** C5 STEP 17 ****
C
C      **** FROM TRAFFIC      TO BUYER
141 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TF(55)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TF(35)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)= 50.00* TF(24)
GOTO 9999

C
C      **** C5 STEP 18 ****
C
C      **** FROM CONTRACTOR      TO BUYER
142 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 12.50* TF(33)

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```

C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 7.00* TR(14)
C      **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** CS STEP 19 ****
C
C      **** FROM TRAFFIC        TO BUYER
143 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 3.00* TR(36)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 1.00* TR(40)
C      **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** CS STEP 20 ****
C
C      **** FROM TRAFFIC        TO BUYER
144 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER          TO PCC
ATT(14)=1
C      PCC          SERVICE TIME
ATT(43)= 1.50* TR(36)
C      **** FROM PCC          TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** CS STEP 21 ****
C
C      **** FROM TRAFFIC        TO BUYER
145 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 1.00* TR(40)
C      **** FROM CLERK          TO TRAFFIC
ATT(28)=1

```

C GOTC 9999
 C
 C ***** C5 STEP 22 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 C 146 ATT(5)=1
 C BUYER SERVICE TIME
 C ATT(42)= .50* TR(56)
 C ***** FROM BUYER TO PCO
 C ATT(14)=1
 C PCO SERVICE TIME
 C ATT(43)= .30* TR(67)
 C ***** FROM PCO TO TRAFFIC
 C ATT(36)=1
 C GOTC 9999

C
 C ***** C5 STEP 23 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 C 147 ATT(5)=1
 C BUYER SERVICE TIME
 C ATT(42)= .50* TR(5)
 C ***** FROM BUYER TO JAG
 C ATT(18)=1
 C JAG SERVICE TIME
 C ATT(49)= 24.00* TR(36)
 C GOTC 9999

C
 C ***** C5 STEP 24 *****
 C
 C ***** FROM JAG TO BUYER
 C 148 ATT(5)=1
 C BUYER SERVICE TIME
 C ATT(42)= .50* TR(6)
 C ***** FROM BUYER TO TRAFFIC
 C ATT(15)=1
 C GOTC 9999

C
 C ***** C5 STEP 25 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 C 149 ATT(5)=1
 C BUYER SERVICE TIME
 C ATT(42)= 1.00* TR(53)
 C ***** FROM BUYER TO CLERK
 C ATT(12)=1
 C CLERK SERVICE TIME
 C ATT(44)= .50* TR(46)

```

C      ***** FROM CLERK          TO TRAFFIC
ATT(26)=1
GOTO 9999

C
C      ***** CS STEP 26 *****
C
C      ***** FROM TRAFFIC        TO BUYER
150 ATT( 5)=1
      BUYER          SERVICE TIME
ATT(42)= .30* TR(33)
C      ***** FROM BUYER          TO PCO
ATT(14)=1
      PCO            SERVICE TIME
ATT(43)= .20* TR(33)
C      ***** FROM PCO            TO COMMITTEE
ATT(51)=1
      COMMITTEE      SERVICE TIME
ATT(51)= 24.00* TR(56)
C      ***** FROM COMMITTEE      TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C      ***** CS STEP 27 *****
C
C      ***** FROM TRAFFIC        TO BUYER
151 ATT( 5)=1
      BUYER          SERVICE TIME
ATT(42)= 3.00* TR(55)
C      ***** FROM BUYER          TO CLERK
ATT(12)=1
      CLERK          SERVICE TIME
ATT(44)= 2.00* TR(34)
C      ***** FROM CLERK          TO TRAFFIC
ATT(26)=1
GOTO 9999

C
C      ***** CS STEP 28 *****
C
C      ***** FROM TRAFFIC        TO BUYER
152 ATT( 5)=1
      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(36)
C      ***** FROM BUYER          TO PCO
ATT(14)=1
      PCO            SERVICE TIME
ATT(43)= .50* TR(45)
C      ***** FROM PCO            TO CLERK
ATT(33)=1

```



```

C          CLERK          SERVICE TIME
ATT(44)= 1.00* TR(53)
C          **** FROM CLERK          TO CONTRACTOR
ATT(27)=1
C          CONTRACTOR    SERVICE TIME
ATT(48)= 80.00* TR(54)
GOTO 9999

C
C          **** C5 STEP 29 ****
C
C          **** FROM CONTRACTOR    TO BUYER
153 ATT(5)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(54)
C          **** FROM BUYER          TO PCO
ATT(14)=1
C          PCO            SERVICE TIME
ATT(43)= .30* TR(31)
C          **** FROM PCO            TO CLERK
ATT(33)=1
C          CLERK          SERVICE TIME
ATT(44)= .30* TR(1)
C          **** FROM CLERK          TO REPRODUCTION
ATT(26)=1
C          REPRODUCTION SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999

C
C          **** C5 STEP 30 ****
C
C          **** FROM REPRODUCTION TO CLERK
154 ATT(10)=1
C          CLERK          SERVICE TIME
ATT(44)= 2.00* TR(24)
C          **** FROM CLERK          TO DISTRIBUTION
ATT(25)=1
C          DISTRIBUTION SERVICE TIME
ATT(52)= 12.00* TR(35)
GOTO 9999
155 GOTO 9999
156 GOTO 9999
157 GOTO 9999
158 GOTO 9999
159 GOTO 9999
160 GOTO 9999
161 GOTO 9999
162 GOTO 9999
163 GOTO 9999

```

```

164 GOTO 9999
C      END OF C5 NETWORK
C      **** C6 NETWORK ****
165 GOTO(166,167,168,169,170,171,172,173,174,175,176,177,
*178,179,180,181,182,183,184,185,186,187,188,189,
*190,191,192,193,194,195,196,197,198,199,200,201,
*202,203,204,205),STEP
C      **** C6 STEP 1 ****
C      **** FROM TRAFFIC      TO PCC
166 ATT(53)=1
C      PCC      SERVICE TIME
ATT(43)= .75* TR(24)
C      **** FROM PCC      TO BUYER
ATT(29)=1
C      BUYER      SERVICE TIME
ATT(42)= 14.50* TR(55)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 8.00* TR(22)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C      **** C6 STEP 2 ****
C
C      **** FROM TRAFFIC      TO BUYER
167 ATT(5)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.50* TR(48)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(56)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C      **** C6 STEP 3 ****
C
C      **** FROM TRAFFIC      TO BUYER
168 ATT(5)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(48)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= 1.30* TR(35)

```

```

C      **** FROM PCC              TO TRAFFIC
      ATT(36)=1
      GOTO 9999

C
C      **** CS STEP   4 ****
C
C      **** FROM TRAFFIC          TO BUYER
169 ATT( 6)=1
      BUYER              SERVICE TIME
      ATT(42)= 1.00* TR(54)
C      **** FROM BUYER            TO CLERK
      ATT(12)=1
      CLERK              SERVICE TIME
      ATT(44)= 1.00* TR(58)
C      **** FROM CLERK            TO TRAFFIC
      ATT(28)=1
      GOTO 9999

C
C      **** CS STEP   5 ****
C
C      **** FROM TRAFFIC          TO BUYER
170 ATT( 6)=1
      BUYER              SERVICE TIME
      ATT(42)= .50* TR(46)
C      **** FROM BUYER            TO PCO
      ATT(14)=1
      PCO                SERVICE TIME
      ATT(43)= .30* TR( 6)
C      **** FROM PCC              TO TRAFFIC
      ATT(36)=1
      GOTO 9999

C
C      **** CS STEP   6 ****
C
C      **** FROM TRAFFIC          TO BUYER
171 ATT( 6)=1
      BUYER              SERVICE TIME
      ATT(42)= .50* TR( 6)
C      **** FROM BUYER            TO JAG
      ATT(18)=1
      JAG                SERVICE TIME
      ATT(45)= 24.00* TR(35)
      GOTO 9999

C
C      **** CS STEP   7 ****
C
C      **** FROM JAG              TO BUYER
172 ATT( 6)=1

```

```

C          BUYER          SERVICE TIME
ATT(42)= .50* TP( 5)
C          **** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C          **** C5 STEP   8 ****
C
C          **** FROM TRAFFIC          TO BUYER
173 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TP(58)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= .50* TP(46)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          **** C6 STEP   9 ****
C
C          **** FROM TRAFFIC          TO BUYER
174 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= .50* TP(48)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= .50* TP(45)
C          **** FROM PCC          TO COMMITTEE
ATT(51)=1
C          COMMITTEE          SERVICE TIME
ATT(51)= 24.00* TP(56)
C          **** FROM COMMITTEE          TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C          **** C6 STEP  10 ****
C
C          **** FROM TRAFFIC          TO BUYER
175 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 3.00* TP(55)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 1.00* TP(56)

```

```

C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** C6 STEP 11 ****
C
C      **** FROM TRAFFIC      TO BUYER
176 ATT(5)=1
      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
      PCO      SERVICE TIME
ATT(43)= .50* TR(48)
C      **** FROM PCO      TO CLERK
ATT(33)=1
      CLERK      SERVICE TIME
ATT(44)= .30* TR(1)
C      **** FROM CLERK      TO REPRODUCTION
ATT(26)=1
      REPRODUCTION SERVICE TIME
ATT(53)= 15.00* TR(54)
GOTO 9999

C
C      **** C6 STEP 12 ****
C
C      **** FROM REPRODUCTION TO CLERK
177 ATT(10)=1
      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(26)
C      **** FROM CLERK      TO BUYER
ATT(21)=1
      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(54)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** C6 STEP 13 ****
C
C      **** FROM TRAFFIC      TO CLERK
178 ATT(10)=1
      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(54)
C      **** FROM CLERK      TO BUYER
ATT(21)=1
      BUYER      SERVICE TIME
ATT(42)= .40* TR(54)

```

```

C      **** FROM BUYER          TO PCC
ATT(14)=1
C      PCC          SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PCC          TO CONTRACTOR
ATT(35)=1
C      CONTRACTOR  SERVICE TIME
ATT(45)=176.00* TR(24)
GOTO 9999

C
C      **** CS STEP  14 ****
C
C      **** FROM CONTRACTOR  TO BUYER
179 ATT( 5)=1
C      BUYER          SERVICE TIME
ATT(42)= 3.00* TR(33)
C      **** FROM BUYER      TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL    SERVICE TIME
ATT(50)=176.00* TR(43)
GOTO 9999

C
C      **** CS STEP  15 ****
C
C      **** FROM TECH.EVAL  TO BUYER
180 ATT( 5)=1
C      BUYER          SERVICE TIME
ATT(42)= 4.00* TR(54)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .50* TR(45)
C      **** FROM CLERK      TO TRAFFIC
ATT(26)=1
GOTO 9999

C
C      **** CS STEP  16 ****
C
C      **** FROM TRAFFIC    TO BUYER
181 ATT( 5)=1
C      BUYER          SERVICE TIME
ATT(42)= 10.00* TR(45)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC          SERVICE TIME
ATT(43)= 1.50* TR(43)
C      **** FROM PCC        TO TRAFFIC
ATT(36)=1

```

```

C      GOTO 9999
C
C      ***** C6 STEP 17 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 182 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 2.00* TR(56)
C      ***** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .20* TR(35)
C      ***** FROM CLERK      TO CONTRACTOR
C      ATT(27)=1
C      CONTRACTOR SERVICE TIME
C      ATT(48)= 31.00* TR(24)
C      GOTO 9999
C
C      ***** C6 STEP 18 *****
C
C      ***** FROM CONTRACTOR TO BUYER
C 183 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 11.00* TR(45)
C      ***** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT( 4)= 7.00* TR(32)
C      ***** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      ***** C6 STEP 19 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 184 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 2.40* TR(54)
C      ***** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.00* TR(49)
C      ***** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      ***** C6 STEP 20 *****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
185 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.50* TR(33)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      **** C6 STEP 21 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
186 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(55)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(45)
C      **** FROM CLERK      TO TRAFFIC
ATT(26)=1
GOTO 9999

```

```

C
C      **** C6 STEP 22 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
187 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(56)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(67)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      **** C6 STEP 23 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
188 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( )
C      **** FROM BUYER
ATT(16)=1

```

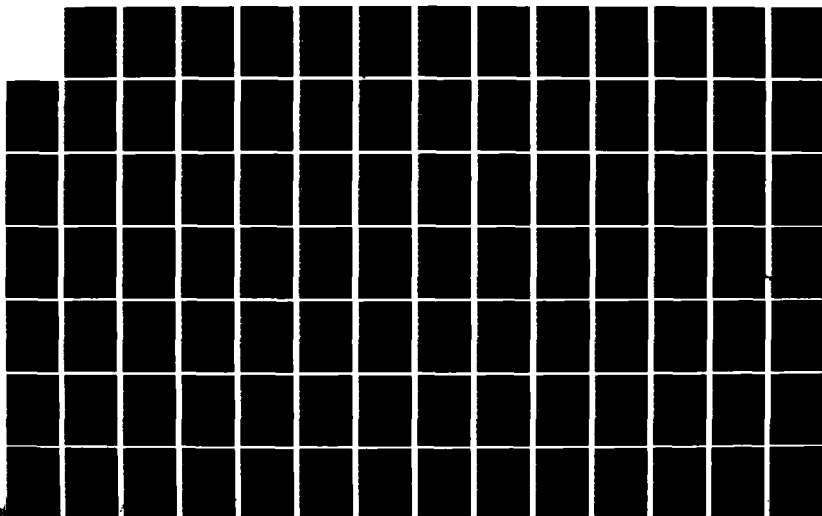

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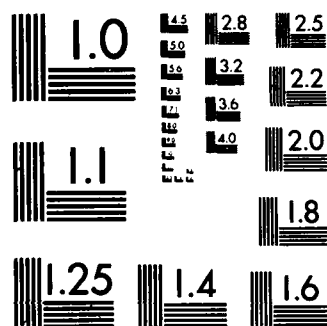
Q-GERT MODEL OF THE CONTRACTING CYCLE(U) AIR FORCE INST 3/8
OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYSTEMS AND
LOGISTICS C D MILLER SEP 83 AFIT-LSSR-118-83

UNCLASSIFIED

F/G 5/1

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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C          JAG          SERVICE TIME
ATT(40)= 24.00* TR(36)
GOTO 9999

C
C      **** C6 STEP 24 ****
C
C      **** FROM JAG          TO BUYER
189 ATT( 5)=1
C          BUYER          SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER          TO TRAFFIC
ATT(15)=1
GOTO 9999

C
C      **** C6 STEP 25 ****
C
C      **** FROM TRAFFIC          TO BUYER
190 ATT( 5)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(58)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= .50* TR(46)
C      **** FROM CLERK          TO TRAFFIC
ATT(20)=1
GOTO 9999

C
C      **** C6 STEP 26 ****
C
C      **** FROM TRAFFIC          TO BUYER
191 ATT( 5)=1
C          BUYER          SERVICE TIME
ATT(42)= .30* TR(33)
C      **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= .50* TR(33)
C      **** FROM PCC          TO COMMITTEE
ATT(61)=1
C          COMMITTEE          SERVICE TIME
ATT(51)= 24.00* TR(56)
C      **** FROM COMMITTEE          TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** C6 STEP 27 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
192 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(45).
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.00* TR(34)
C      **** FROM CLERK      TO TRAFFIC
ATT(25)=1
GOTO 9999

C
C      **** C6 STEP 28 ****
C
C      **** FROM TRAFFIC      TO BUYER
193 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(36)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .50* TR(45)
C      **** FROM PCC      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(33)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(46)= 50.00* TR(54)
GOTO 9999

C
C      **** C6 STEP 29 ****
C
C      **** FROM CONTRACTOR      TO BUYER
194 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .30* TR(31)
C      **** FROM PCC      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR( 1)
C      **** FROM CLERK      TO REPRODUCTION
ATT(26)=1

```

```

C      REPRODUCTION SERVICE TIME
      ATT(53)= 16.00* TR(54)
      GOTO 9999

C
C      ***** C6 STEP 30 *****
C
C      ***** FROM REPRODUCTION TO CLERK
195 ATT(10)=1
C      CLERK      SERVICE TIME
      ATT(44)= 2.00* TR(24)
C      ***** FROM CLERK      TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTO 9999
196 GOTO 9999
197 GOTO 9999
198 GOTO 9999
199 GOTO 9999
200 GOTO 9999
201 GOTO 9999
202 GOTO 9999
203 GOTO 9999
204 GOTO 9999
205 GOTO 9999
C      END OF C6 NETWORK
C      ***** C7 NETWORK *****
206 GOTO(207,208,209,210,211,212,213,214,215,216,217,218,
      *219,220,221,222,223,224,225,226,227,228,229,230,
      *231,232,233,234,235,236,237,238,239,240,241,242,
      *243,244,245,246),STEP
C      ***** C7 STEP 1 *****
C      ***** FROM TRAFFIC      TO PCC
207 ATT(58)=1
C      PCC      SERVICE TIME
      ATT(43)= 1.00* TR(24)
C      ***** FROM PCC      TO BUYER
      ATT(29)=1
C      BUYER      SERVICE TIME
      ATT(42)= 17.00* TR(54)
C      ***** FROM BUYER      TO CLERK
      ATT(12)=1
C      CLERK      SERVICE TIME
      ATT(44)= 8.50* TR(13)
C      ***** FROM CLERK      TO TRAFFIC
      ATT(28)=1
      GOTO 9999
C

```

C ***** C7 STEP 2 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 208 ATT(5)=1
 C BUYER SERVICE TIME
 ATT(42)= 3.00* TR(55)
 C ***** FROM BUYER TO CLERK
 ATT(12)=1
 C CLERK SERVICE TIME
 ATT(44)= 1.00* TR(56)
 C ***** FROM CLERK TO TRAFFIC
 ATT(28)=1
 GOTD 9999

C ***** C7 STEP 3 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 209 ATT(6)=1
 C BUYER SERVICE TIME
 ATT(42)= .50* TR(49)
 C ***** FROM BUYER TO PCO
 ATT(14)=1
 C PCO SERVICE TIME
 ATT(43)= 2.00* TR(26)
 C ***** FROM PCO TO TRAFFIC
 ATT(36)=1
 GOTD 9999

C ***** C7 STEP 4 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 210 ATT(5)=1
 C BUYER SERVICE TIME
 ATT(42)= 1.00* TR(34)
 C ***** FROM BUYER TO CLERK
 ATT(12)=1
 C CLERK SERVICE TIME
 ATT(44)= 1.00* TR(56)
 C ***** FROM CLERK TO TRAFFIC
 ATT(29)=1
 GOTD 9999

C ***** C7 STEP 5 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 211 ATT(6)=1
 C BUYER SERVICE TIME
 ATT(42)= .50* TR(46)

```

C      **** FROM BUYER          TO PCG
ATT(14)=1
C      PCG          SERVICE TIME
ATT(43)= .30* TR( 6)
C      **** FROM PCG          TO TRAFFIC
ATT(35)=1
GOTO 9999

C
C      **** C7 STEP   6 ****
C
C      **** FROM TRAFFIC      TO BUYER
212 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO JAG
ATT(15)=1
C      JAG          SERVICE TIME
ATT(49)= 24.00* TR(35)
GOTO 9999

C
C      **** C7 STEP   7 ****
C
C      **** FROM JAG          TO BUYER
213 ATT( 5)=1
C      BUYER          SERVICE TIME
ATT(42)= .50* TR( 5)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** C7 STEP   8 ****
C
C      **** FROM TRAFFIC      TO BUYER
214 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(55)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .50* TR(46)
C      **** FROM CLERK      TO TRAFFIC
ATT(20)=1
GOTO 9999

C
C      **** C7 STEP   9 ****
C
C      **** FROM TRAFFIC      TO BUYER
215 ATT( 6)=1

```

```

C          BUYER          SERVICE TIME
ATT(42)= .50* TP(45)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= .50* TP(45)
C          **** FROM PCC          TO COMMITTEE
ATT(51)=1
C          COMMITTEE          SERVICE TIME
ATT(51)= 24.00* TP(56)
C          **** FROM COMMITTEE          TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C          **** C7 STEP 10 ****
C
C          **** FROM TRAFFIC          TO BUYER
216 ATT( 5)=1
C          BUYER          SERVICE TIME
ATT(42)= 3.00* TP(55)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 1.00* TP(56)
C          **** FROM CLERK          TO TRAFFIC
ATT(25)=1
GOTO 9999

C
C          **** C7 STEP 11 ****
C
C          **** FROM TRAFFIC          TO BUYER
217 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TP(54)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= .50* TP(45)
C          **** FROM PCC          TO CLERK
ATT(33)=1
C          CLERK          SERVICE TIME
ATT(44)= .30* TP( 1)
C          **** FROM CLERK          TO REPRODUCTION
ATT(25)=1
C          REPRODUCTION SERVICE TIME
ATT(53)= 16.00* TP(54)
GOTO 9999

C

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```

C      **** C7 STEP 12 ****
C
C      **** FROM REPRODUCTION TO CLERK
218 ATT(10)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(26)
C      **** FROM CLERK      TO BUYER
ATT(21)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(34)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** C7 STEP 13 ****
C
C      **** FROM TRAFFIC      TO CLERK
219 ATT(10)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(54)
C      **** FROM CLERK      TO BUYER
ATT(21)=1
C      BUYER      SERVICE TIME
ATT(42)= .40* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PCO      TO CONTRACTOR
ATT(35)=1
C      CONTRACTOR      SERVICE TIME
ATT(46)=175.00* TR(24)
GOTO 9999

C
C      **** C7 STEP 14 ****
C
C      **** FROM CONTRACTOR      TO BUYER
220 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(33)
C      **** FROM BUYER      TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL      SERVICE TIME
ATT(50)=175.00* TR(43)
GOTO 9999

C
C      **** C7 STEP 15 ****
C

```

```

C      **** FROM TECH.EVAL      TO BUYER
221 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 4.00* TR(54)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(45)
C      **** FROM CLERK      TO TRAFFIC
ATT(22)=1
GOTO 9999

C
C      **** C7 STEP 16 ****
C
C      **** FROM TRAFFIC      TO BUYER
222 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 7.00* TR(35)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.50* TR(33)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** C7 STEP 17 ****
C
C      **** FROM TRAFFIC      TO BUYER
223 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(55)
C      **** FROM BUYER      TO TRAFFIC
ATT(15)=1
GOTO 9999

C
C      **** C7 STEP 18 ****
C
C      **** FROM TRAFFIC      TO BUYER
224 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(55)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(35)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1

```

```

C          CONTRACTOR  SERVICE TIME
C      ATT(46)= 64.00* TP(35)
C      GOTO 9999
C
C          ***** C7 STEP 19 *****
C
C          ***** FROM CONTRACTOR  TO BUYER
C      225 ATT( 6)=1
C          BUYER          SERVICE TIME
C      ATT(42)= 6.00* TP(16)
C          ***** FROM BUYER          TO CLERK
C      ATT(12)=1
C          CLERK          SERVICE TIME
C      ATT(44)= 8.50* TP(13)
C          ***** FROM CLERK          TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C          ***** C7 STEP 20 *****
C
C          ***** FROM TRAFFIC          TO BUYER
C      226 ATT( 6)=1
C          BUYER          SERVICE TIME
C      ATT(42)= 2.00* TP(56)
C          ***** FROM BUYER          TO CLERK
C      ATT(12)=1
C          CLERK          SERVICE TIME
C      ATT(44)= 1.00* TP(48)
C          ***** FROM CLERK          TO TRAFFIC
C      ATT(26)=1
C      GOTO 9999
C
C          ***** C7 STEP 21 *****
C
C          ***** FROM TRAFFIC          TO BUYER
C      227 ATT( 6)=1
C          BUYER          SERVICE TIME
C      ATT(42)= 1.00* TP(54)
C          ***** FROM BUYER          TO PCO
C      ATT(14)=1
C          PCO          SERVICE TIME
C      ATT(43)= 2.00* TP(26)
C          ***** FROM PCO          TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C          ***** C7 STEP 22 *****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
228 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(46)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      **** C7 STEP 23 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
229 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(56)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(67)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      **** C7 STEP 24 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
230 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO JAG
ATT(18)=1
C      JAG      SERVICE TIME
ATT(49)= 24.00* TR(36)
GOTO 9999

```

```

C
C      **** C7 STEP 25 ****
C

```

```

C      **** FROM JAG      TO BUYER
231 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999
C

```

```

C      **** C7 STEP 26 ****
C
C      **** FROM TRAFFIC      TO BUYER
232 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(58)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(46)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** C7 STEP 27 ****
C
C      **** FROM TRAFFIC      TO BUYER
233 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .30* TR(33)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .80* TR(33)
C      **** FROM PCO      TO COMMITTEE
ATT(51)=1
C      COMMITTEE      SERVICE TIME
ATT(51)= 24.00* TR(56)
C      **** FROM COMMITTEE      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** C7 STEP 28 ****
C
C      **** FROM TRAFFIC      TO BUYER
234 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(65)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.00* TR(34)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** C7 STEP 29 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
235 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(36)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .50* TR(45)
C      **** FROM PCC      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(53)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(46)= 20.00* TR(54)
GOTO 9999

C
C      **** C7 STEP 30 ****
C
C      **** FROM CONTRACTOR      TO BUYER
236 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(29)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .20* TR(36)
C      **** FROM PCC      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** C7 STEP 31 ****
C
C      **** FROM TRAFFIC      TO BUYER
237 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(76)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR( 1)
C      **** FROM CLERK      TO REPRODUCTION
ATT(26)=1
C      REPRODUCTION SERVICE TIME
ATT(53)= 15.00* TR(54)
GOTO 9999
C

```

```

C      **** C7 STEP 32 ****
C
C      **** FROM REPRODUCTION TO CLERK
238 ATT(10)=1
C      CLERK          SERVICE TIME
      ATT(44)= 2.00* TR(24)
C      **** FROM CLERK          TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTO 9999
239 GOTO 9999
240 GOTO 9999
241 GOTO 9999
242 GOTO 9999
243 GOTO 9999
244 GOTO 9999
245 GOTO 9999
246 GOTO 9999
C      END OF C7 NETWORK
C      **** C8 NETWORK ****
247 GOTO(248,249,250,251,252,253,254,255,256,257,258,259,
      *260,261,262,263,264,265,266,267,268,269,270,271,
      *272,273,274,275,276,277,278,279,280,281,282,283,
      *284,285,286,287,288),STEP
C      **** C8 STEP 1 ****
C      **** FROM TRAFFIC          TO PCO
248 ATT(58)=1
C      PCO          SERVICE TIME
      ATT(43)= 1.50* TR(33)
C      **** FROM PCO          TO BUYER
      ATT(29)=1
C      BUYER          SERVICE TIME
      ATT(42)= 24.00* TR(63)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= 1.00* TR(54)
C      **** FROM CLERK          TO TRAFFIC
      ATT(25)=1
      GOTO 9999
C
C      **** C8 STEP 2 ****
C
C      **** FROM TRAFFIC          TO BUYER
249 ATT(5)=1
C      BUYER          SERVICE TIME
      ATT(42)= 2.00* TR(56)

```

C ***** FROM BUYER 2 TRAFFIC
 ATT(15)=1
 GOTO 9999

C
 C ***** C8 STEP 3 *****

C ***** FROM TRAFFIC TO BUYER
 250 ATT(5)=1
 C BUYER SERVICE TIME
 ATT(42)= 12.00* TR(35)
 C ***** FROM BUYER TO CLERK
 ATT(12)=1
 C CLERK SERVICE TIME
 ATT(44)= 10.00* TR(22)
 C ***** FROM CLERK TO TRAFFIC
 ATT(28)=1
 GOTO 9999

C
 C ***** C8 STEP 4 *****

C ***** FROM TRAFFIC TO BUYER
 251 ATT(5)=1
 C BUYER SERVICE TIME
 ATT(42)= 3.00* TR(35)
 C ***** FROM BUYER TO CLERK
 ATT(12)=1
 C CLERK SERVICE TIME
 ATT(44)= 1.00* TR(56)
 C ***** FROM CLERK TO TRAFFIC
 ATT(28)=1
 GOTO 9999

C
 C ***** C8 STEP 5 *****

C ***** FROM TRAFFIC TO BUYER
 252 ATT(6)=1
 C BUYER SERVICE TIME
 ATT(42)= .50* TP(48)
 C ***** FROM BUYER TO PCO
 ATT(14)=1
 C PCO SERVICE TIME
 ATT(43)= 3.00* TP(36)
 C ***** FROM PCO TO TRAFFIC
 ATT(36)=1
 GOTO 9999

C
 C ***** C8 STEP 6 *****


```

C      **** FROM TRAFFIC      TO BUYER
253 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TP(54)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TP(59)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      **** C9 STEP 7 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
254 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TP(46)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TP( 6)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      **** C8 STEP 8 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
255 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TP( 6)
C      **** FROM BUYER      TO JAG
ATT(18)=1
C      JAG      SERVICE TIME
ATT(49)= 24.00* TP(35)
GOTO 9999

```

```

C
C      **** C8 STEP 9 ****
C

```

```

C      **** FROM JAG      TO BUYER
256 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TP( 5)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

```

```

C

```

```

C      **** C8 STEP 10 ****
C
C      **** FROM TRAFFIC      TO BUYER
257 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(58)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(46)
C      **** FROM CLERK      TO TRAFFIC
ATT(23)=1
GOTO 9999

C
C      **** C8 STEP 11 ****
C
C      **** FROM TRAFFIC      TO BUYER
258 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(45)
C      **** FROM PCO      TO COMMITTEE
ATT(51)=1
C      COMMITTEE      SERVICE TIME
ATT(51)= 24.00* TR(56)
C      **** FROM COMMITTEE      TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C      **** C8 STEP 12 ****
C
C      **** FROM TRAFFIC      TO BUYER
259 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(55)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(56)
C      **** FROM CLERK      TO TRAFFIC
ATT(23)=1
GOTO 9999

C
C      **** C8 STEP 13 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
260 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(45)
C      **** FROM PCO      TO MANAGEMENT
ATT(37)=1
C      MANAGEMENT      SERVICE TIME
ATT(54)= 32.00* TR(55)
GOTO 9999

```

```

C
C      ***** CB STEP 14 *****
C

```

```

C      **** FROM MANAGEMENT      TO BUYER
261 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

```

```

C
C      ***** CB STEP 15 *****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
262 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(26)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.00* TR(54)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      ***** CB STEP 16 *****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
263 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .80* TR(55)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(26)

```

```

C      **** FROM PCO      TO CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .30* TR(1)
C      **** FROM CLERK      TO REPRODUCTION
C      ATT(26)=1
C      REPRODUCTION SERVICE TIME
C      ATT(53)= 16.00* TP(54)
C      GOTO 9999
C
C      **** C8 STEP 17 ****
C
C      **** FROM REPRODUCTION TO CLERK
C 264 ATT(10)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.00* TP(26)
C      **** FROM CLERK      TO BUYER
C      ATT(21)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 3.00* TR(54)
C      **** FROM BUYER      TO TRAFFIC
C      ATT(16)=1
C      GOTO 9999
C
C      **** C3 STEP 18 ****
C
C      **** FROM TRAFFIC      TO CLERK
C 265 ATT(10)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.00* TR(54)
C      **** FROM CLERK      TO BUYER
C      ATT(21)=1
C      BUYER      SERVICE TIME
C      ATT(42)= .40* TP(54)
C      **** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .30* TR(35)
C      **** FROM PCO      TO CONTRACTOR
C      ATT(35)=1
C      CONTRACTOR SERVICE TIME
C      ATT(48)=176.00* TP(24)
C      GOTO 9999
C
C      **** C8 STEP 19 ****
C
C      **** FROM CONTRACTOR TO BUYER
C 266 ATT(5)=1

```

```

C          BUYER          SERVICE TIME
ATT(42)= 3.00* TP(33)
C          **** FROM BUYER          TO TECH.EVAL
ATT(19)=1
C          TECH.EVAL      SERVICE TIME
ATT(53)=176.00* TR(43)
GOTO 9999

C          **** C8 STEP 20 ****
C          **** FROM TECH.EVAL      TO BUYER
267 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 4.00* TR(54)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= .50* TR(46)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C          **** C8 STEP 21 ****
C          **** FROM TRAFFIC      TO BUYER
268 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 15.00* TR(53)
C          **** FROM BUYER          TO AUDIT
ATT(20)=1
C          AUDIT          SERVICE TIME
ATT(55)=352.00* TR(54)
GOTO 9999

C          **** C8 STEP 22 ****
C          **** FROM AUDIT      TO BUYER
269 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 2.00* TR(54)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= 2.00* TP(53)
C          **** FROM PCC          TO TRAFFIC
ATT(36)=1
GOTO 9999

```

C ***** C8 STEP 23 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 270 ATT(5)=1
 C BUYER SERVICE TIME
 ATT(42)= 3.00* TR(33)
 C ***** FROM BUYER TO CLERK
 ATT(12)=1
 C CLERK SERVICE TIME
 ATT(44)= .80* TR(35)
 C ***** FROM CLERK TO CONTRACTOR
 ATT(27)=1
 C CONTRACTOR SERVICE TIME
 ATT(48)= 54.00* TR(35)
 GOTD 9999

C ***** C8 STEP 24 *****
 C
 C ***** FROM CONTRACTOR TO BUYER
 271 ATT(5)=1
 C BUYER SERVICE TIME
 ATT(42)= 10.00* TR(54)
 C ***** FROM BUYER TO CLERK
 ATT(12)=1
 C CLERK SERVICE TIME
 ATT(44)= 10.00* TR(21)
 C ***** FROM CLERK TO TRAFFIC
 ATT(28)=1
 GOTD 9999

C ***** C8 STEP 25 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 272 ATT(6)=1
 C BUYER SERVICE TIME
 ATT(42)= 2.00* TR(56)
 C ***** FROM BUYER TO CLERK
 ATT(12)=1
 C CLERK SERVICE TIME
 ATT(44)= 1.00* TR(40)
 C ***** FROM CLERK TO TRAFFIC
 ATT(28)=1
 GOTD 9999

C ***** C8 STEP 26 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 273 ATT(5)=1

```

C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 3.00* TR(35)
C      **** FROM PCC      TO TRAFFIC
ATT(35)=1
GOTO 9999

```

```

C
C      **** C8 STEP 27 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
274 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(46)
C      **** FROM CLERK      TO TRAFFIC
ATT(26)=1
GOTO 9999

```

```

C
C      **** C8 STEP 28 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
275 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(56)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(67)
C      **** FROM PCC      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      **** C8 STEP 29 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
276 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO JAG
ATT(16)=1
C      JAG      SERVICE TIME
ATT(49)= 24.00* TR(36)

```

```

      GOTO 9999
C
C      ***** C8 STEP 30 *****
C
C      ***** FROM JAG          TO BUYER
277 ATT( 5)=1
C      BUYER          SERVICE TIME
      ATT(42)= .50* TR( 6)
C      ***** FROM BUYER      TO TRAFFIC
      ATT(16)=1
      GOTO 9999
C
C      ***** C8 STEP 31 *****
C
C      ***** FROM TRAFFIC     TO BUYER
278 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 1.00* TR(58)
C      ***** FROM BUYER      TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= .50* TR(46)
C      ***** FROM CLERK      TO TRAFFIC
      ATT(28)=1
      GOTO 9999
C
C      ***** C8 STEP 32 *****
C
C      ***** FROM TRAFFIC     TO BUYER
279 ATT( 8)=1
C      BUYER          SERVICE TIME
      ATT(42)= .30* TR(33)
C      ***** FROM BUYER      TO PCO
      ATT(14)=1
C      PCO            SERVICE TIME
      ATT(43)= .50* TR(33)
C      ***** FROM PCO        TO COMMITTEE
      ATT(61)=1
C      COMMITTEE      SERVICE TIME
      ATT(51)= 24.00* TR(56)
C      ***** FROM COMMITTEE  TO TRAFFIC
      ATT(39)=1
      GOTO 9999
C
C      ***** C8 STEP 33 *****
C
C      ***** FROM TRAFFIC     TO BUYER
280 ATT( 6)=1

```



```

C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(65)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.00* TR(34)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** C8 STEP 34 ****
C
C      **** FROM TRAFFIC      TO BUYER
281 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(36)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(45)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** C8 STEP 35 ****
C
C      **** FROM TRAFFIC      TO BUYER
282 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO COMMITTEE
ATT(15)=1
C      COMMITTEE      SERVICE TIME
ATT(51)= 24.00* TR(35)
C      **** FROM COMMITTEE      TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C      **** C8 STEP 36 ****
C
C      **** FROM TRAFFIC      TO BUYER
283 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999
C

```

```

C      **** C8 STEP 37 ****
C
C      **** FROM TRAFFIC      TO BUYER
284 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(57)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(56)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** C8 STEP 38 ****
C
C      **** FROM TRAFFIC      TO BUYER
285 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .90* TR(46)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(53)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)= 80.00* TR(54)
GOTO 9999

C
C      **** C8 STEP 39 ****
C
C      **** FROM CONTRACTOR      TO BUYER
286 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 2.00* TR(54)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999
C

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```

C      ***** C3 STEP 40 *****
C
C      ***** FROM TRAFFIC          TO BUYER
287 ATT(6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(59)
C      ***** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .30* TR(1)
C      ***** FROM CLERK          TO REPRODUCTION
ATT(26)=1
C      REPRODUCTION SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999

C
C      ***** C3 STEP 41 *****
C
C      ***** FROM REPRODUCTION TO CLERK
288 ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 2.00* TR(24)
C      ***** FROM CLERK          TO DISTRIBUTION
ATT(25)=1
C      DISTRIBUTION SERVICE TIME
ATT(52)= 12.00* TR(35)
GOTO 9999

C      END OF C3 NETWORK
C      ***** F2 NETWORK *****
289 GOTO(290,291,292,293,294,295,296,297,298,299,300,301,
*302,303,304,305,306,307,308,309,310,311,312,313,
*314,315,316,317,318,319,320,321,322,323,324,325,
*326,327,328,329),STEP
C      ***** F2 STEP 1 *****
C      ***** FROM TRAFFIC          TO PCC
290 ATT(58)=1
C      PCC          SERVICE TIME
ATT(43)= .50* TR(48)
C      ***** FROM PCC          TO BUYER
ATT(29)=1
C      BUYER          SERVICE TIME
ATT(42)= 6.00* TR(23)
C      ***** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 4.00* TR(23)
C      ***** FROM CLERK          TO TRAFFIC
ATT(29)=1

```

```

GOTO 9999
C
C      **** F2 STEP  2 ****
C
C      **** FROM TRAFFIC      TO BUYER
291 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(56)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C      **** F2 STEP  3 ****
C
C      **** FROM TRAFFIC      TO BUYER
292 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(48)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(26)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999
C
C      **** F2 STEP  4 ****
C
C      **** FROM TRAFFIC      TO BUYER
293 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(58)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C      **** F2 STEP  5 ****
C
C      **** FROM TRAFFIC      TO BUYER
294 ATT( 5)=1

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C          BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C          **** FROM BUYER          TO PCO
ATT(14)=1
C          PCO          SERVICE TIME
ATT(43)= .50* TR(44)
C          **** FROM PCO          TO CLERK
ATT(33)=1
C          CLERK          SERVICE TIME
ATT(44)= .30* TR(1)
C          **** FROM CLERK          TO REPRODUCTION
ATT(26)=1
C          REPRODUCTION SERVICE TIME
ATT(53)= 16.00* TR(34)
GOTO 9999

C
C          **** F2 STEP 6 ****
C
C          **** FROM REPRODUCTION TO CLERK
295 ATT(10)=1
C          CLERK          SERVICE TIME
ATT(44)= 1.00* TR(26)
C          **** FROM CLERK          TO CONTRACTOR
ATT(27)=1
C          CONTRACTOR SERVICE TIME
ATT(48)=176.00* TR(14)
GOTO 9999

C
C          **** F2 STEP 7 ****
C
C          **** FROM CONTRACTOR TO BUYER
295 ATT(6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(56)
C          **** FROM BUYER          TO TECH.EVAL
ATT(19)=1
C          TECH.EVAL SERVICE TIME
ATT(50)=100.00* TR(25)
GOTO 9999

C
C          **** F2 STEP 8 ****
C
C          **** FROM TECH.EVAL TO BUYER
297 ATT(6)=1
C          BUYER          SERVICE TIME
ATT(42)= 4.00* TR(34)
C          **** FROM BUYER          TO CLERK
ATT(12)=1

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C          CLERK          SERVICE TIME
ATT(44)= .50* TP(45)
C          **** FROM CLERK          TO TRAFFIC
ATT(29)=1
GOTO 9999

C
C          **** F2 STEP   9  ****
C
C          **** FROM TRAFFIC          TO BUYER
298 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 6.00* TP(33)
C          **** FROM BUYER          TO PCO
ATT(14)=1
C          PCO          SERVICE TIME
ATT(43)= 1.00* TP(54)
C          **** FROM PCO          TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C          **** F2 STEP  10  ****
C
C          **** FROM TRAFFIC          TO BUYER
299 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 2.00* TP(54)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= .80* TP(35)
C          **** FROM CLERK          TO CONTRACTOR
ATT(27)=1
C          CONTRACTOR          SERVICE TIME
ATT(48)= 62.00* TP(34)
GOTO 9999

C
C          **** F2 STEP  11  ****
C
C          **** FROM CONTRACTOR          TO BUYER
300 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 7.00* TP(12)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 3.00* TP(33)
C          **** FROM CLERK          TO TRAFFIC
ATT(26)=1

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C      GOTO 9999
C
C      ***** F2 STEP 12 *****
C
C      ***** FROM TRAFFIC      TO BUYER
301 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(54)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(48)
C      ***** FROM CLERK      TO TRAFFIC
ATT(26)=1
GOTO 9999
C
C      ***** F2 STEP 13 *****
C
C      ***** FROM TRAFFIC      TO BUYER
302 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      ***** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= 1.00* TR(24)
C      ***** FROM PCC      TO TRAFFIC
ATT(36)=1
GOTO 9999
C
C      ***** F2 STEP 14 *****
C
C      ***** FROM TRAFFIC      TO BUYER
303 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(46)
C      ***** FROM CLERK      TO TRAFFIC
ATT(26)=1
GOTO 9999
C
C      ***** F2 STEP 15 *****
C
C      ***** FROM TRAFFIC      TO BUYER
304 ATT( 6)=1

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C          BUYER          SERVICE TIME
ATT(42)= .50* TR(56)
C          **** FROM BUYER          TO PCO
ATT(14)=1
C          PCO          SERVICE TIME ,
ATT(43)= .50* TR(45)
C          **** FROM PCO          TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C          **** F2 STEP 16 ****
C
C          **** FROM TRAFFIC          TO BUYER
305 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= .50* TR( 5)
C          **** FROM BUYER          TO JAG
ATT(13)=1
C          JAG          SERVICE TIME
ATT(49)= 16.00* TR(56)
GOTO 9999

C
C          **** F2 STEP 17 ****
C
C          **** FROM JAG          TO BUYER
306 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= .50* TR( 6)
C          **** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C          **** F2 STEP 18 ****
C
C          **** FROM TRAFFIC          TO BUYER
307 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(56)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= .50* TR(46)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          **** F2 STEP 19 ****
C

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C      **** FROM TRAFFIC      TO BUYER
308 ATT(6)=1
C      BUYER      SERVICE TIME
ATT(42)= .30* TR(33)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(6)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(53)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)= 54.00* TR(44)
GOTO 9999

C
C      **** F2 STEP 20 ****
C
C      **** FROM CONTRACTOR      TO BUYER
309 ATT(6)=1
C      BUYER      SERVICE TIME
ATT(42)= .30* TR(33)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR(1)
C      **** FROM CLERK      TO REPRODUCTION
ATT(26)=1
C      REPRODUCTION      SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999

C
C      **** F2 STEP 21 ****
C
C      **** FROM REPRODUCTION      TO CLERK
310 ATT(10)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.00* TR(24)
C      **** FROM CLERK      TO DISTRIBUTION
ATT(25)=1
C      DISTRIBUTION      SERVICE TIME
ATT(52)= 12.00* TR(35)

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        GOTO 9999
311 GOTO 9999
312 GOTO 9999
313 GOTO 9999
314 GOTO 9999
315 GOTO 9999
316 GOTO 9999
317 GOTO 9999
318 GOTO 9999
319 GOTO 9999
320 GOTO 9999
321 GOTO 9999
322 GOTO 9999
323 GOTO 9999
324 GOTO 9999
325 GOTO 9999
326 GOTO 9999
327 GOTO 9999
328 GOTO 9999
329 GOTO 9999
C      END OF F2 NETWORK
C      **** S2 NETWORK ****
330 GOTO(331,332,333,334,335,336,337,338,339,340,341,342,
      *343,344,345,346,347,348,349,350,351,352,353,354,
      *355,356,357,358,359,360,361,362,363,364,365,366,
      *367,368,369,370),STEP
C      **** S2 STEP 1 ****
C      **** FROM TRAFFIC TO PCC
331 ATT(58)=1
C      PCC SERVICE TIME
      ATT(43)= .50* TR(59)
C      **** FROM PCC TO BUYER
      ATT(29)=1
C      BUYER SERVICE TIME
      ATT(42)= 8.00* TR(24)
C      **** FROM BUYER TO CLERK
      ATT(12)=1
C      CLERK SERVICE TIME
      ATT(44)= 3.00* TR(33)
C      **** FROM CLERK TO TRAFFIC
      ATT(28)=1
      GOTO 9999
C
C      **** S2 STEP 2 ****
C
C      **** FROM TRAFFIC TO BUYER
332 ATT( 6)=1
C      BUYER SERVICE TIME

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ATT(42)= .80* TR(33)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR( 1)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S2 STEP  3 ****
C
C      **** FROM TRAFFIC      TO BUYER
333 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(56)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** S2 STEP  4 ****
C
C      **** FROM TRAFFIC      TO BUYER
334 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(51)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S2 STEP  5 ****
C
C      **** FROM TRAFFIC      TO BUYER
335 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR( 5)
C      **** FROM PCO      TO CLERK

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C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.50* TR(44)
C      **** FROM CLERK      TO CONTRACTOR
C      ATT(27)=1
C      CONTRACTOR  SERVICE TIME
C      ATT(48)=176.00* TR(44)
C      GOTO 9999
C
C      **** S2 STEP  6 ****
C
C      **** FROM CONTRACTOR  TO BUYER
336 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO TECH.EVAL
C      ATT(19)=1
C      TECH.EVAL  SERVICE TIME
C      ATT(50)=104.00* TR(36)
C      GOTO 9999
C
C      **** S2 STEP  7 ****
C
C      **** FROM TECH.EVAL  TO BUYER
337 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 2.00* TR(55)
C      **** FROM BUYER      TO TRAFFIC
C      ATT(16)=1
C      GOTO 9999
C
C      **** S2 STEP  8 ****
C
C      **** FROM TRAFFIC    TO BUYER
338 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 5.00* TR(24)
C      **** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO        SERVICE TIME
C      ATT(43)= .80* TR(55)
C      **** FROM PCO        TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      **** S2 STEP  9 ****
C
C      **** FROM TRAFFIC    TO BUYER

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339 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(56)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** S2 STEP 10 ****
C
C      **** FROM TRAFFIC      TO BUYER
340 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 8.00* TR(53)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 4.50* TR(33)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S2 STEP 11 ****
C
C      **** FROM TRAFFIC      TO BUYER
341 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .80* TR(33)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S2 STEP 12 ****
C
C      **** FROM TRAFFIC      TO BUYER
342 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .75* TR(33)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(56)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

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C
C      ***** S2 STEP 13 *****
C
C      ***** FROM TRAFFIC      TO BUYER
343 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(43)
C      ***** FROM CLERK      TO TRAFFIC
ATT(23)=1
GOTO 9999

C
C      ***** S2 STEP 14 *****
C
C      ***** FROM TRAFFIC      TO BUYER
344 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)
C      ***** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .30* TR( 7)
C      ***** FROM PCC      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(13)
C      ***** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(46)= 80.00* TR(54)
GOTO 9999

C
C      ***** S2 STEP 15 *****
C
C      ***** FROM CONTRACTOR      TO BUYER
345 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      ***** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .30* TR(31)
C      ***** FROM PCC      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME

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      ATT(44)= .30* TR( 5)
C      ***** FROM CLERK.          TO REPRODUCTION
      ATT(25)=1
C      REPRODUCTION SERVICE TIME
      ATT(53)= 16.00* TP(54)
      GOTO 9999
C
C      ***** S2 STEP 16 *****
C
C      ***** FROM REPRODUCTION TO CLERK
346 ATT(10)=1
C      CLERK          SERVICE TIME
      ATT(44)= 1.00* TR( 4)
C      ***** FROM CLERK          TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTO 9999
347 GOTO 9999
348 GOTO 9999
349 GOTO 9999
350 GOTO 9999
351 GOTO 9999
352 GOTO 9999
353 GOTO 9999
354 GOTO 9999
355 GOTO 9999
356 GOTO 9999
357 GOTO 9999
358 GOTO 9999
359 GOTO 9999
360 GOTO 9999
361 GOTO 9999
362 GOTO 9999
363 GOTO 9999
364 GOTO 9999
365 GOTO 9999
366 GOTO 9999
367 GOTO 9999
368 GOTO 9999
369 GOTO 9999
370 GOTO 9999
C      END OF S2 NETWORK
C      ***** S3 NETWORK *****
371 GOTO(372,373,374,375,376,377,378,379,380,381,382,383,
      *384,385,386,387,388,389,390,391,392,393,394,395,
      *396,397,398,399,400,401,402,403,404,405,406,407,
      *408,409,410,411),STEP

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C      ***** S3 STEP 1 *****
C      ***** FROM TRAFFIC          TO PCO
372 ATT(58)=1
C      PCO          SERVICE TIME
ATT(43)= .80* TR(33)
C      ***** FROM PCO          TO BUYER
ATT(29)=1
C      BUYER          SERVICE TIME
ATT(42)= 2.50* TR(25)
C      ***** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 5.00* TR(33)
C      ***** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      ***** S3 STEP 2 *****
C
C      ***** FROM TRAFFIC          TO BUYER
373 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(56)
C      ***** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .50* TR( 1)
C      ***** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      ***** S3 STEP 3 *****
C
C      ***** FROM TRAFFIC          TO BUYER
374 ATT( 5)=1
C      BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C      ***** FROM BUYER          TO PCO
ATT(14)=1
C      PCO          SERVICE TIME
ATT(43)= 1.00* TR(56)
C      ***** FROM PCO          TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      ***** S3 STEP 4 *****
C
C      ***** FROM TRAFFIC          TO BUYER

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375 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(51)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S3 STEP 5 ****
C
C      **** FROM TRAFFIC      TO BUYER
376 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .30* TR( 6)
C      **** FROM PCC      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.50* TR(44)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(43)=176.00* TR(44)
GOTO 9999

C
C      **** S3 STEP 6 ****
C
C      **** FROM CONTRACTOR      TO BUYER
377 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL      SERVICE TIME
ATT(50)=104.00* TR(36)
GOTO 9999

C
C      **** S3 STEP 7 ****
C
C      **** FROM TECH.EVAL      TO BUYER
378 ATT( 6)=1
C      BUYER      SERVICE TIME

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ATT(42)= 2.00* TR(55)
C      **** FROM BUYER          TO TRAFFIC
ATT(15)=1
GOTO 9999

C
C      **** S3 STEP   8  ****
C
C      **** FROM TRAFFIC        TO BUYER
379 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 5.00* TR(24)
C      **** FROM BUYER          TO PCC
ATT(14)=1
C      PCC           SERVICE TIME
ATT(43)= .50* TR(44)
C      **** FROM PCC           TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** S3 STEP   9  ****
C
C      **** FROM TRAFFIC        TO BUYER
380 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 2.00* TR(55)
C      **** FROM BUYER          TO TRAFFIC
ATT(15)=1
GOTO 9999

C
C      **** S3 STEP  10  ****
C
C      **** FROM TRAFFIC        TO BUYER
381 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 6.00* TR(35)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 5.00* TR(43)
C      **** FROM CLERK          TO TRAFFIC
ATT(26)=1
GOTO 9999

C
C      **** S3 STEP  11  ****
C
C      **** FROM TRAFFIC        TO BUYER
382 ATT( 6)=1
C      BUYER          SERVICE TIME

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```

ATT(42)= 1.50* TR(33)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .80* TR(33)
C      **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

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C
C      **** S3 STEP 12 ****
C

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```

C      **** FROM TRAFFIC        TO BUYER
383 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .75* TR(33)
C      **** FROM BUYER          TO PCC
ATT(14)=1
C      PCC          SERVICE TIME
ATT(43)= 1.10* TR(25)
C      **** FROM PCC          TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      **** S3 STEP 13 ****
C

```

```

C      **** FROM TRAFFIC        TO BUYER
384 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .50* TR(49)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 1.00* TR(43)
C      **** FROM CLERK          TO TRAFFIC
ATT(23)=1
GOTO 9999

```

```

C
C      **** S3 STEP 14 ****
C

```

```

C      **** FROM TRAFFIC        TO BUYER
385 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .50* TR(66)
C      **** FROM BUYER          TO PCC
ATT(14)=1
C      PCC          SERVICE TIME
ATT(43)= .30* TR( 7)
C      **** FROM PCC          TO TRAFFIC

```

```

ATT(36)=1
GOTO 9999

C
C
C      ***** S3 STEP 15 *****
C
C      ***** FROM TRAFFIC      TO BUYER
386 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      ***** FROM BUYER      TO JAG
ATT(18)=1
C      JAG      SERVICE TIME
ATT(49)= 24.00* TR(35)
GOTO 9999

C
C
C      ***** S3 STEP 16 *****
C
C      ***** FROM JAG      TO BUYER
387 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      ***** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C
C      ***** S3 STEP 17 *****
C
C      ***** FROM TRAFFIC      TO BUYER
388 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.50* TR(66)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .80* TR(33)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C
C      ***** S3 STEP 18 *****
C
C      ***** FROM TRAFFIC      TO BUYER
389 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      ***** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME

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```

      ATT(43)= .30* TR(37)
C      **** FROM FCC          TO CLERK
      ATT(33)=1
C      CLERK          SERVICE TIME
      ATT(44)= 1.00* TR(13)
C      **** FROM CLERK          TO CONTRACTOR
      ATT(27)=1
C      CONTRACTOR    SERVICE TIME
      ATT(43)= 80.00* TR(54)
      GOTO 9999
C
C      **** S3 STEP 19 ****
C
C      **** FROM CONTRACTOR    TO BUYER
390 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 1.00* TR(56)
C      **** FROM BUYER          TO PCO
      ATT(14)=1
C      PCO            SERVICE TIME
      ATT(43)= .30* TR(35)
C      **** FROM FCC          TO CLERK
      ATT(33)=1
C      CLERK          SERVICE TIME
      ATT(44)= .30* TR( 5)
C      **** FROM CLERK          TO REPRODUCTION
      ATT(26)=1
C      REPRODUCTION SERVICE TIME
      ATT(53)= 16.00* TR(54)
      GOTO 9999
C
C      **** S3 STEP 20 ****
C
C      **** FROM REPRODUCTION TO CLERK
391 ATT(10)=1
C      CLERK          SERVICE TIME
      ATT(44)= 1.00* TR( 4)
C      **** FROM CLERK          TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTO 9999
392 GOTO 9999
393 GOTO 9999
394 GOTO 9999
395 GOTO 9999
396 GOTO 9999
397 GOTO 9999

```

```

398 GOTO 9999
399 GOTO 9999
400 GOTO 9999
401 GOTO 9999
402 GOTO 9999
403 GOTO 9999
404 GOTO 9999
405 GOTO 9999
406 GOTO 9999
407 GOTO 9999
408 GOTO 9999
409 GOTO 9999
410 GOTO 9999
411 GOTO 9999
C      END OF S3 NETWORK
C      **** S4 NETWORK ****
412 GOTO(413,414,415,416,417,418,419,420,421,422,423,424,
      *425,426,427,428,429,430,431,432,433,434,435,436,
      *437,438,439,440,441,442,443,444,445,446,447,448,
      *449,450,451,452),STEP
C      **** S4 STEP 1 ****
C      **** FROM TRAFFIC      TO PCO
413 ATT(56)=1
C      PCO      SERVICE TIME
      ATT(43)= .90* TR(35)
C      **** FROM PCO      TO BUYER
      ATT(29)=1
C      BUYER      SERVICE TIME
      ATT(42)= 5.50* TR(25)
C      **** FROM BUYER      TO CLERK
      ATT(12)=1
C      CLERK      SERVICE TIME
      ATT(44)= 5.00* TR(32)
C      **** FROM CLERK      TO TRAFFIC
      ATT(28)=1
      GOTO 9999
C
C      **** S4 STEP 2 ****
C
C      **** FROM TRAFFIC      TO BUYER
414 ATT( 6)=1
C      BUYER      SERVICE TIME
      ATT(42)= 1.00* TR(26)
C      **** FROM BUYER      TO CLERK
      ATT(12)=1
C      CLERK      SERVICE TIME
      ATT(44)= .50* TR( 1)
C      **** FROM CLERK      TO TRAFFIC

```

```

C      **** S4 STEP    3 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 415 ATT( 6)=1
C          BUYER      SERVICE TIME
C      ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCO
C      ATT(14)=1
C          PCO      SERVICE TIME
C      ATT(43)= 1.00* TR(46)
C      **** FROM PCO      TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      **** S4 STEP    4 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 416 ATT( 5)=1
C          BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C          CLERK      SERVICE TIME
C      ATT(44)= 1.00* TR(51)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** S4 STEP    5 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 417 ATT( 5)=1
C          BUYER      SERVICE TIME
C      ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCO
C      ATT(14)=1
C          PCO      SERVICE TIME
C      ATT(43)= .30* TR( 6)
C      **** FROM PCO      TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      **** S4 STEP    6 ****
C
C      **** FROM TRAFFIC      TO BUYER

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```

418 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO JAG
ATT(13)=1
C      JAG      SERVICE TIME
ATT(49)= 24.00* TR(35)
GOTO 9999

C
C      **** S4 STEP 7 ****
C
C      **** FROM JAG      TO BUYER
419 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** S4 STEP 8 ****
C
C      **** FROM TRAFFIC      TO BUYER
420 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .20* TR(33)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S4 STEP 9 ****
C
C      **** FROM TRAFFIC      TO BUYER
421 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(46)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.50* TR(44)
C      **** FROM CLERK      TO CONTRACTOR

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C      ATT(27)=1
C      CONTRACTOR . SERVICE TIME
C      ATT(48)=176.00* TR(44)
C      GOTO 9999
C
C      ***** S4 STEP 10 *****
C
C      ***** FROM CONTRACTOR TO BUYER
C 422 ATT( 5)=1
C      BUYER SERVICE TIME
C      ATT(42)= 1.00* TR(54)
C      ***** FROM BUYER TO TECH.EVAL
C      ATT(19)=1
C      TECH.EVAL SERVICE TIME
C      ATT(50)=104.00* TR(36)
C      GOTO 9999
C
C      ***** S4 STEP 11 *****
C
C      ***** FROM TECH.EVAL TO BUYER
C 423 ATT( 5)=1
C      BUYER SERVICE TIME
C      ATT(42)= 2.00* TR(55)
C      ***** FROM BUYER TO TRAFFIC
C      ATT(16)=1
C      GOTO 9999
C
C      ***** S4 STEP 12 *****
C
C      ***** FROM TRAFFIC TO BUYER
C 424 ATT( 5)=1
C      BUYER SERVICE TIME
C      ATT(42)= 5.00* TR(44)
C      ***** FROM BUYER TO FCC
C      ATT(14)=1
C      FCC SERVICE TIME
C      ATT(43)= .90* TR(35)
C      ***** FROM FCC TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      ***** S4 STEP 13 *****
C
C      ***** FROM TRAFFIC TO BUYER
C 425 ATT( 5)=1
C      BUYER SERVICE TIME
C      ATT(42)= 2.50* TR(66)
C      ***** FROM BUYER TO TRAFFIC

```

```

ATT(15)=1
GOTO 9999

C
C
C      ***** S4 STEP 14 *****
C
C      ***** FROM TRAFFIC      TO BUYER
426 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 6.00* TR(36)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 5.00* TR(32)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C
C      ***** S4 STEP 15 *****
C
C      ***** FROM TRAFFIC      TO BUYER
427 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.50* TR(33)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .80* TR(33)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C
C      ***** S4 STEP 16 *****
C
C      ***** FROM TRAFFIC      TO BUYER
428 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .75* TR(33)
C      ***** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= 1.30* TR(35)
C      ***** FROM PCC      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C
C      ***** S4 STEP 17 *****
C
C      ***** FROM TRAFFIC      TO BUYER

```

```

429 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(43)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S4 STEP 18 ****
C
C      **** FROM TRAFFIC      TO BUYER
430 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(56)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR( 7)
C      **** FROM PCO      TO TRAFFIC
ATT(35)=1
GOTO 9999

C
C      **** S4 STEP 19 ****
C
C      **** FROM TRAFFIC      TO BUYER
431 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO JAG
ATT(18)=1
C      JAG      SERVICE TIME
ATT(49)= 24.00* TR(35)
GOTO 9999

C
C      **** S4 STEP 20 ****
C
C      **** FROM JAG      TO BUYER
432 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** S4 STEP 21 ****

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```

C
C      **** FROM TRAFFIC      TO BUYER
433 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.50* TP(66)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(33)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S4 STEP 22 ****
C
C      **** FROM TRAFFIC      TO BUYER
434 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(37)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TP(13)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)= 80.00* TP(54)
GOTO 9999

C
C      **** S4 STEP 23 ****
C
C      **** FROM CONTRACTOR      TO BUYER
435 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(33)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR( 5)
C      **** FROM CLERK      TO REPRODUCTION

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      ATT(26)=1
C      REPRODUCTION SERVICE TIME
      ATT(53)= 16.00* TR(54)
      GOTO 9999
C
C      ***** S4 STEP 24 *****
C
C      ***** FROM REPRODUCTION TO CLERK
436 ATT(10)=1
C      CLERK SERVICE TIME
      ATT(44)= 1.00* TR(4)
C      ***** FROM CLERK TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTO 9999
437 GOTO 9999
438 GOTO 9999
439 GOTO 9999
440 GOTO 9999
441 GOTO 9999
442 GOTO 9999
443 GOTO 9999
444 GOTO 9999
445 GOTO 9999
446 GOTO 9999
447 GOTO 9999
448 GOTO 9999
449 GOTO 9999
450 GOTO 9999
451 GOTO 9999
452 GOTO 9999
C      END OF S4 NETWORK
C      ***** S5 NETWORK *****
453 GOTO(454,455,456,457,458,459,460,461,462,463,464,465,
      *466,467,468,469,470,471,472,473,474,475,476,477,
      *478,479,480,481,482,483,484,485,486,487,488,489,
      *490,491,492,493),STEP
C      ***** S5 STEP 1 *****
C      ***** FROM TRAFFIC TO PCO
454 ATT(58)=1
C      PCO SERVICE TIME
      ATT(43)= .80* TR(33)
C      ***** FROM PCO TO BUYER
      ATT(29)=1
C      BUYER SERVICE TIME
      ATT(42)= 10.00* TR(25)
C      ***** FROM BUYER TO CLERK

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```

C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 4.00* TR(23)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** SS STEP 2 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 455 ATT( 5)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 2.00* TR(56)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .50* TR( 1)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** SS STEP 3 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 456 ATT( 5)=1
C      BUYER      SERVICE TIME
C      ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCC
C      ATT(14)=1
C      PCC      SERVICE TIME
C      ATT(43)= 1.00* TR(27)
C      **** FROM PCC      TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      **** SS STEP 4 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 457 ATT( 5)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.00* TR(51)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999

```

```

C
C      ***** S5 STEP   5 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 458 ATT( 5)=1
C          BUYER      SERVICE TIME
C      ATT(42)= .50* TR(45)
C      ***** FROM BUYER      TO PCO
C      ATT(14)=1
C          PCO      SERVICE TIME
C      ATT(43)= .30* TR( 6)
C      ***** FROM PCO      TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      ***** S5 STEP   6 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 459 ATT( 6)=1
C          BUYER      SERVICE TIME
C      ATT(42)= .50* TR( 6)
C      ***** FROM BUYER      TO JAG
C      ATT(12)=1
C          JAG      SERVICE TIME
C      ATT(49)= 24.00* TR(35)
C      GOTO 9999
C
C      ***** S5 STEP   7 *****
C
C      ***** FROM JAG      TO BUYER
C 460 ATT( 6)=1
C          BUYER      SERVICE TIME
C      ATT(42)= .50* TR( 6)
C      ***** FROM BUYER      TO TRAFFIC
C      ATT(16)=1
C      GOTO 9999
C
C      ***** S5 STEP   8 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 461 ATT( 6)=1
C          BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(55)
C      ***** FROM BUYER      TO CLERK
C      ATT(12)=1
C          CLERK      SERVICE TIME
C      ATT(44)= .50* TR(33)
C      ***** FROM CLERK      TO TRAFFIC

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```
ATT(28)=1
GOTO 9599
```

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C      **** S5 STEP    5 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 462 ATT( 5)=1
C      BUYER      SERVICE TIME
C ATT(42)=      .50* TR(46)
C      **** FROM BUYER      TO PCO
C ATT(14)=1
C      PCO      SERVICE TIME
C ATT(43)=      .50* TR(46)
C      **** FROM PCO      TO COMMITTEE
C ATT(61)=1
C      COMMITTEE      SERVICE TIME
C ATT(51)= 24.00* TR(45)
C      **** FROM COMMITTEE      TO TRAFFIC
C ATT(38)=1
C GOTQ 9999

```

```

C      **** S5 STEP 10 ****
C
C      **** FROM TRAFFIC      TO BUYER
463 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(57)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.00* TR(54)
C      **** FROM CLERK      TO TRAFFIC
ATT(26)=1
GOTO 9999

```

```

C      **** S5 STEP 11 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 464 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)=      .80* TR(65)
C      **** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)=      .80* TR(65)
C      **** FROM PCO      TO CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME

```



```

C      ATT(44)= .50* TR(41)
C      **** FROM CLERK      TO REPRODUCTION
C      ATT(26)=1
C      REPRODUCTION SERVICE TIME
C      ATT(53)= 16.00* TR(54)
C      GOTO 9999
C
C      **** S5 STEP 12 ****
C
C      **** FROM REPRODUCTION TO CLERK
C 465 ATT(10)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.50* TR(44)
C      **** FROM CLERK      TO CONTRACTOR
C      ATT(27)=1
C      CONTRACTOR SERVICE TIME
C      ATT(48)=176.00* TR(44)
C      GOTO 9999
C
C      **** S5 STEP 13 ****
C
C      **** FROM CONTRACTOR TO BUYER
C 466 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(34)
C      **** FROM BUYER      TO TECH.EVAL
C      ATT(19)=1
C      TECH.EVAL SERVICE TIME
C      ATT(50)=104.00* TR(36)
C      GOTO 9999
C
C      **** S5 STEP 14 ****
C
C      **** FROM TECH.EVAL TO BUYER
C 467 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 2.00* TR(55)
C      **** FROM BUYER      TO TRAFFIC
C      ATT(16)=1
C      GOTO 9999
C
C      **** S5 STEP 15 ****
C
C      **** FROM TRAFFIC TO BUYER
C 468 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 5.00* TR(24)
C      **** FROM BUYER      TO PCO

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```

C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .30* TR(33)
C      ***** FROM PCO      TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      ***** S5 STEP 16 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 469 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 3.00* TR(35)
C      ***** FROM BUYER      TO TRAFFIC
C      ATT(16)=1
C      GOTO 9999
C
C      ***** S5 STEP 17 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 470 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 2.00* TR(34)
C      ***** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 4.00* TR(23)
C      ***** FROM CLERK      TO TRAFFIC
C      ATT(25)=1
C      GOTO 9999
C
C      ***** S5 STEP 18 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 471 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 2.00* TR(34)
C      ***** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .80* TR(33)
C      ***** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      ***** S5 STEP 19 *****
C
C      ***** FROM TRAFFIC      TO BUYER

```

```

472 ATT(-6)=1
C      BUYER      SERVICE TIME
ATT(42)= .75* TR(33)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.50* TR(33)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** S5 STEP 20 ****
C
C      **** FROM TRAFFIC      TO BUYER
473 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(43)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S5 STEP 21 ****
C
C      **** FROM TRAFFIC      TO BUYER
474 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(66)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR( 7)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** S5 STEP 22 ****
C
C      **** FROM TRAFFIC      TO BUYER
475 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO JAG
ATT(18)=1
C      JAG      SERVICE TIME

```

ATT(49)= 24.00* TP(35)
GOTO 9999

C

C

***** S5 STEP 23 *****

C

C

***** FROM JAG TO BUYER

476 ATT(2)=1

C

BUYER SERVICE TIME

ATT(42)= .50* TR(6)

C

***** FROM BUYER TO TRAFFIC

ATT(16)=1

GOTO 9999

C

C

***** S5 STEP 24 *****

C

C

***** FROM TRAFFIC TO BUYER

477 ATT(6)=1

C

BUYER SERVICE TIME

ATT(42)= 1.50* TP(66)

C

***** FROM BUYER TO CLERK

ATT(12)=1

C

CLERK SERVICE TIME

ATT(44)= .50* TP(33)

C

***** FROM CLERK TO TRAFFIC

ATT(28)=1

GOTO 9999

C

C

***** S5 STEP 25 *****

C

C

***** FROM TRAFFIC TO BUYER

478 ATT(6)=1

C

BUYER SERVICE TIME

ATT(42)= 1.00* TR(54)

C

***** FROM BUYER TO PCO

ATT(14)=1

C

PCO SERVICE TIME

ATT(43)= .30* TR(37)

C

***** FROM PCO TO COMMITTEE

ATT(61)=1

C

COMMITTEE SERVICE TIME

ATT(51)= 24.00* TP(35)

C

***** FROM COMMITTEE TO TRAFFIC

ATT(38)=1

GOTO 9999

C

C

***** S5 STEP 26 *****

C

C

***** FROM TRAFFIC TO BUYER

```

479 ATT( 5)=1
C   BUYER      SERVICE TIME
ATT(42)= 2.00* TR(57)
C   **** FROM BUYER      TO CLERK
ATT(12)=1
C   CLERK      SERVICE TIME
ATT(44)= 1.00* TR(54)
C   **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 5399

C
C   **** S5 STEP 27 ****
C
C   **** FROM TRAFFIC      TO BUYER
480 ATT( 5)=1
C   BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C   **** FROM BUYER      TO PCO
ATT(14)=1
C   PCO      SERVICE TIME
ATT(43)= .50* TR(46)
C   **** FROM PCO      TO CLERK
ATT(33)=1
C   CLERK      SERVICE TIME
ATT(44)= 1.00* TR(13)
C   **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C   CONTRACTOR SERVICE TIME
ATT(46)= 80.00* TR(54)
GOTO 9399

C
C   **** S5 STEP 28 ****
C
C   **** FROM CONTRACTOR TO BUYER
481 ATT( 6)=1
C   BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C   **** FROM BUYER      TO PCO
ATT(14)=1
C   PCO      SERVICE TIME
ATT(43)= .30* TR(36)
C   **** FROM PCO      TO CLERK
ATT(33)=1
C   CLERK      SERVICE TIME
ATT(44)= .30* TR( 5)
C   **** FROM CLERK      TO REPRODUCTION
ATT(26)=1
C   REPRODUCTION SERVICE TIME

```

```

ATT(53)= 15.00* TR(54)
GOTO 9959

C
C      ***** S5 STEP 29 *****
C
C      ***** FROM REPRODUCTION TO CLERK
482 ATT(10)=1
C      CLERK          SERVICE TIME
ATT(44)= 1.00* TR(4)
C      ***** FROM CLERK          TO DISTRIBUTION
ATT(25)=1
C      DISTRIBUTION SERVICE TIME
ATT(52)= 12.00* TR(35)
GOTO 9999
483 GOTO 9999
484 GOTO 9999
485 GOTO 9999
486 GOTO 9999
487 GOTO 9999
488 GOTO 9999
489 GOTO 9999
490 GOTO 9999
491 GOTO 9999
492 GOTO 9999
493 GOTO 9999
C      END OF S5 NETWORK
C      ***** S6 NETWORK *****
494 GOTO(495,496,497,498,499,500,501,502,503,504,505,506,
*507,508,509,510,511,512,513,514,515,516,517,518,
*519,520,521,522,523,524,525,526,527,528,529,530,
*531,532,533,534),STEP
C      ***** S6 STEP 1 *****
C      ***** FROM TRAFFIC          TO PCO
495 ATT(53)=1
C      PCO          SERVICE TIME
ATT(43)= .80* TR(33)
C      ***** FROM PCO          TO BUYER
ATT(29)=1
C      BUYER          SERVICE TIME
ATT(42)= 12.00* TP(35)
C      ***** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 4.50* TR(23)
C      ***** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9994
C

```

```

C      ***** S6 STEP 2 *****
C
C      ***** FROM TRAFFIC      TO BUYER
496 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(58)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR( 1)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C      ***** S6 STEP 3 *****
C
C      ***** FROM TRAFFIC      TO BUYER
497 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      ***** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= 1.30* TR(35)
C      ***** FROM PCC      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C      ***** S6 STEP 4 *****
C
C      ***** FROM TRAFFIC      TO BUYER
498 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(51)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C      ***** S6 STEP 5 *****
C
C      ***** FROM TRAFFIC      TO BUYER
499 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)

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```

C      **** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .30* TR( 5)
C      **** FROM PCC      TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      **** S6 STEP  6 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 500 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO JAG
C      ATT(18)=1
C      JAG      SERVICE TIME
C      ATT(49)= 24.00* TR(35)
C      GOTO 9999
C
C      **** S6 STEP  7 ****
C
C      **** FROM JAG      TO BUYER.
C 501 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO TRAFFIC
C      ATT(16)=1
C      GOTO 9999
C
C      **** S6 STEP  8 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 502 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .80* TR(33)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(23)=1
C      GOTO 9999
C
C      **** S6 STEP  9 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 503 ATT( 6)=1

```



```

C          BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C          **** FROM BUYER          TO PCO
ATT(14)=1
C          PCO          SERVICE TIME
ATT(43)= .50* TR(46)
C          **** FROM PCO          TO COMMITTEE
ATT(51)=1
C          COMMITTEE          SERVICE TIME
ATT(51)= 24.00* TR(45)
C          **** FROM COMMITTEE          TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C          **** S6 STEP 10 ****
C
C          **** FROM TRAFFIC          TO BUYER
504 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 2.00* TR(57)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 2.00* TR(54)
C          **** FROM CLERK          TO TRAFFIC
ATT(24)=1
GOTO 9999

C
C          **** S6 STEP 11 ****
C
C          **** FROM TRAFFIC          TO BUYER
505 ATT( 5)=1
C          BUYER          SERVICE TIME
ATT(42)= .60* TR(55)
C          **** FROM BUYER          TO PCO
ATT(14)=1
C          PCO          SERVICE TIME
ATT(43)= .60* TR(55)
C          **** FROM PCO          TO CLERK
ATT(33)=1
C          CLERK          SERVICE TIME
ATT(44)= .50* TR(41)
C          **** FROM CLERK          TO REPRODUCTION
ATT(26)=1
C          REPRODUCTION SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999
C

```

```

C      ***** S6 STEP 12 *****
C
C      ***** FROM REPRODUCTION TO CLERK
506 ATT(10)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.50* TR(44)
C      ***** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR SERVICE TIME
ATT(48)=176.00* TR(34)
GOTO 9999
C
C      ***** S6 STEP 13 *****
C
C      ***** FROM CONTRACTOR TO BUYER
507 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      ***** FROM BUYER      TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL  SERVICE TIME
ATT(50)=104.00* TR(36)
GOTO 9999
C
C      ***** S6 STEP 14 *****
C
C      ***** FROM TECH.EVAL TO BUYER
508 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(55)
C      ***** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999
C
C      ***** S6 STEP 15 *****
C
C      ***** FROM TRAFFIC TO BUYER
509 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 6.00* TR(36)
C      ***** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= 1.00* TR(54)
C      ***** FROM PCC      TO TRAFFIC
ATT(36)=1
GOTO 9999
C

```

```

C      ***** S6 STEP 16 *****
C
C      ***** FROM TRAFFIC      TO BUYER
510 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(38)
C      ***** FROM BUYER      TO TRAFFIC
ATT(15)=1
GOTO 9999
C
C      ***** S6 STEP 17 *****
C
C      ***** FROM TRAFFIC      TO BUYER
511 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 6.00* TR(34)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 4.00* TR(23)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C      ***** S6 STEP 18 *****
C
C      ***** FROM TRAFFIC      TO BUYER
512 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(55)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .80* TR(33)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C      ***** S6 STEP 19 *****
C
C      ***** FROM TRAFFIC      TO BUYER
513 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .75* TR(33)
C      ***** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= 1.50* TR(36)

```

```

C      **** FROM PCC      TO TRAFFIC
      ATT(35)=1
      GOTO 9999

C
C      **** S6 STEP 20 ****
C
C      **** FROM TRAFFIC      TO BUYER
514 ATT( 6)=1
      BUYER      SERVICE TIME
      ATT(42)= .50* TR(49)
C      **** FROM BUYER      TO CLERK
      ATT(12)=1
      CLERK      SERVICE TIME
      ATT(44)= 1.00* TR(43)
C      **** FROM CLERK      TO TRAFFIC
      ATT(23)=1
      GOTO 9999

C
C      **** S6 STEP 21 ****
C
C      **** FROM TRAFFIC      TO BUYER
515 ATT( 6)=1
      BUYER      SERVICE TIME
      ATT(42)= .50* TR(66)
C      **** FROM BUYER      TO PCO
      ATT(14)=1
      PCO      SERVICE TIME
      ATT(43)= .30* TR( 7)
C      **** FROM PCC      TO TRAFFIC
      ATT(35)=1
      GOTO 9999

C
C      **** S6 STEP 22 ****
C
C      **** FROM TRAFFIC      TO BUYER
516 ATT( 6)=1
      BUYER      SERVICE TIME
      ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO JAG
      ATT(18)=1
      JAG      SERVICE TIME
      ATT(49)= 24.00* TR(35)
      GOTO 9999

C
C      **** S6 STEP 23 ****
C
C      **** FROM JAG      TO BUYER
517 ATT( 6)=1

```

```

C          BUYER          SERVICE TIME
ATT(42)= .50* TR( 6)
C          **** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C          **** S6 STEP  24 ****
C
C          **** FROM TRAFFIC          TO BUYER
518 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.50* TR(56)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= .80* TR(33)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          **** S6 STEP  25 ****
C
C          **** FROM TRAFFIC          TO BUYER
519 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(54)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= .30* TR(37)
C          **** FROM PCC          TO COMMITTEE
ATT(61)=1
C          COMMITTEE          SERVICE TIME
ATT(51)= 24.00* TR(35)
C          **** FROM COMMITTEE          TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C          **** S6 STEP  26 ****
C
C          **** FROM TRAFFIC          TO BUYER
520 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 2.00* TR(57)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 1.00* TR(54)

```

```

C      **** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTO 9999
C
C      **** S6 STEP 27 ****
C
C      **** FROM TRAFFIC        TO BUYER
521 ATT( 6)=1
      BUYER          SERVICE TIME
      ATT(42)= 1.00* TP(54)
C      **** FROM BUYER          TO PCO
      ATT(14)=1
C      PCO           SERVICE TIME
      ATT(43)= .50* TP(46)
C      **** FROM PCO           TO CLERK
      ATT(33)=1
C      CLERK         SERVICE TIME
      ATT(44)= 1.00* TP(13)
C      **** FROM CLERK        TO CONTRACTOR
      ATT(27)=1
C      CONTRACTOR    SERVICE TIME
      ATT(48)= 80.00* TP(55)
      GOTO 9999
C
C      **** S6 STEP 28 ****
C
C      **** FROM CONTRACTOR    TO BUYER
522 ATT( 6)=1
      BUYER          SERVICE TIME
      ATT(42)= 1.50* TP(56)
C      **** FROM BUYER        TO PCO
      ATT(14)=1
C      PCO           SERVICE TIME
      ATT(43)= .30* TP( 8)
C      **** FROM PCO         TO CLERK
      ATT(33)=1
C      CLERK         SERVICE TIME
      ATT(44)= .30* TP( 5)
C      **** FROM CLERK      TO REPRODUCTION
      ATT(26)=1
C      REPRODUCTION SERVICE TIME
      ATT(53)= 16.00* TP(54)
      GOTO 9999
C
C      **** S6 STEP 29 ****
C
C      **** FROM REPRODUCTION TO CLERK
523 ATT(10)=1

```

```

C          CLERK          SERVICE TIME
ATT(44)= 1.00* TR( 4)
C          **** FROM CLERK          TO DISTRIBUTION
ATT(25)=1
C          DISTRIBUTION SERVICE TIME
ATT(52)= 12.00* TP(35)
GOTO 9999
524 GOTO 9999
525 GOTO 9999
526 GOTO 9999
527 GOTO 9999
528 GOTO 9999
529 GOTO 9999
530 GOTO 9999
531 GOTO 9999
532 GOTO 9999
533 GOTO 9999
534 GOTO 9999
C          END OF S6 NETWORK
C          **** S7 NETWORK ****
535 GOTO(536,537,538,539,540,541,542,543,544,545,546,547,
*548,549,550,551,552,553,554,555,556,557,558,559,
*560,561,562,563,564,565,566,567,568,569,570,571,
*572,573,574,575),STEP
C          **** S7 STEP 1 ****
C          **** FROM TRAFFIC          TO PCC
536 ATT(58)=1
C          PCC          SERVICE TIME
ATT(43)= 1.50* TR(33)
C          **** FROM PCC          TO BUYER
ATT(29)=1
C          BUYER          SERVICE TIME
ATT(42)= 12.00* TR(35)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 5.00* TR(22)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C          **** S7 STEP 2 ****
C
C          **** FROM TRAFFIC          TO BUYER
537 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 3.00* TP(35)
C          **** FROM BUYER          TO CLERK

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```

ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR( 1)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S7 STEP  3 ****
C
C      **** FROM TRAFFIC      TO BUYER
538 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= 2.50* TR(44)
C      **** FROM PCC      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** S7 STEP  4 ****
C
C      **** FROM TRAFFIC      TO BUYER
539 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(51)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S7 STEP  5 ****
C
C      **** FROM TRAFFIC      TO BUYER
540 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .30* TR( 6)
C      **** FROM PCC      TO TRAFFIC
ATT(36)=1
GOTO 9999

```



```

C
C      ***** S7 STEP   6 *****
C
C      ***** FROM TRAFFIC           TO BUYER
541 ATT( 6)=1
C      BUYER           SERVICE TIME
ATT(42)= .50* TR( 6)
C      ***** FROM BUYER           TO JAG
ATT(18)=1
C      JAG           SERVICE TIME
ATT(49)= 24.00* TR(35)
GOTO 9999
C
C      ***** S7 STEP   7 *****
C
C      ***** FROM JAG           TO BUYER
542 ATT( 6)=1
C      BUYER           SERVICE TIME
ATT(42)= .50* TR( 6)
C      ***** FROM BUYER           TO TRAFFIC
ATT(16)=1
GOTO 9999
C
C      ***** S7 STEP   8 *****
C
C      ***** FROM TRAFFIC           TO BUYER
543 ATT( 6)=1
C      BUYER           SERVICE TIME
ATT(42)= 1.00* TR(36)
C      ***** FROM BUYER           TO CLERK
ATT(12)=1
C      CLERK           SERVICE TIME
ATT(44)= .80* TR(33)
C      ***** FROM CLERK           TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C      ***** S7 STEP   9 *****
C
C      ***** FROM TRAFFIC           TO BUYER
544 ATT( 6)=1
C      BUYER           SERVICE TIME
ATT(42)= .50* TR(46)
C      ***** FROM BUYER           TO PCC
ATT(14)=1
C      PCC           SERVICE TIME
ATT(43)= .50* TR(46)
C      ***** FROM PCC           TO COMMITTEE

```

```

ATT(61)=1
C COMMITTEE SERVICE TIME
ATT(51)= 24.00* TR(45)
C ***** FROM COMMITTEE TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C ***** S7 STEP 10 *****
C
C ***** FROM TRAFFIC TO BUYER
545 ATT(61)=1
C BUYER SERVICE TIME
ATT(42)= 2.00* TR(57)
C ***** FROM BUYER TO CLERK
ATT(12)=1
C CLERK SERVICE TIME
ATT(44)= 2.00* TR(54)
C ***** FROM CLERK TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C ***** S7 STEP 11 *****
C
C ***** FROM TRAFFIC TO BUYER
546 ATT(61)=1
C BUYER SERVICE TIME
ATT(42)= .80* TR(65)
C ***** FROM BUYER TO PCO
ATT(14)=1
C PCO SERVICE TIME
ATT(43)= .80* TR(65)
C ***** FROM PCO TO CLERK
ATT(33)=1
C CLERK SERVICE TIME
ATT(44)= .50* TR(41)
C ***** FROM CLERK TO REPRODUCTION
ATT(26)=1
C REPRODUCTION SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999

C
C ***** S7 STEP 12 *****
C
C ***** FROM REPRODUCTION TO CLERK
547 ATT(10)=1
C CLERK SERVICE TIME
ATT(44)= 1.50* TR(44)
C ***** FROM CLERK TO BUYER

```

```

ATT(21)=1
C      BUYER      SERVICE TIME
ATT(42)= 5.00* TR(64)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** S7 STEP 13 ****
C
C      **** FROM TRAFFIC      TO CLERK
548 ATT(10)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(23)
C      **** FROM CLERK      TO BUYER
ATT(21)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(74)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(46)
C      **** FROM PCO      TO CONTRACTOR
ATT(35)=1
C      CONTRACTOR      SERVICE TIME
ATT(43)=176.00* TR(34)
GOTO 9999

C
C      **** S7 STEP 14 ****
C
C      **** FROM CONTRACTOR      TO BUYER
549 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL      SERVICE TIME
ATT(50)=104.00* TR(36)
GOTO 9999

C
C      **** S7 STEP 15 ****
C
C      **** FROM TECH.EVAL      TO BUYER
550 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(55)
C      **** FROM BUYER      TO AUDIT
ATT(20)=1
C      AUDIT      SERVICE TIME

```

ATT(55)=352.00* TR(54)
GOTO 9999

```

C      ***** 37 STEP 20 *****
C
C      ***** FROM TRAFFIC          TO BUYER
555 ATT( 6 )=1
C      BUYER          SERVICE TIME
ATT(42)= 2.00* TR(56)
C      ***** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .80* TR(33)
C      ***** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 3333

```

```

C      **** S7 STEP 21 ****
C
C      **** FROM TRAFFIC      TO BUYER
556 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .75* TR(33)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 2.00* TR(23)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C      **** 37 STEP  22  ****
C
C      **** FROM TRAFFIC      TO BUYER
557 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(43)
C      **** FROM CLERK      TO TRAFFIC
ATT(23)=1
GO TO 3335

```

253

```

558 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(66)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR( 7)
C      **** FROM PCO      TO TRAFFIC
ATT(35)=1
GOTO 9999

```

```

C
C      **** S7 STEP 24 ****
C
C      **** FROM TRAFFIC      TO BUYER

```

```

559 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO JAG
ATT(18)=1
C      JAG      SERVICE TIME
ATT(49)= 24.00* TP(35)
GOTO 9999

```

```

C
C      **** S7 STEP 25 ****
C
C      **** FROM JAG      TO BUYER

```

```

560 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TP( 6)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

```

```

C
C      **** S7 STEP 26 ****
C
C      **** FROM TRAFFIC      TO BUYER

```

```

561 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.50* TR(66)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .60* TR(33)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      **** S7 STEP 27 ****

```

```

C
C      **** FROM TRAFFIC      TO BUYER
562 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(37)
C      **** FROM PCO      TO COMMITTEE
ATT(61)=1
C      COMMITTEE      SERVICE TIME
ATT(51)= 24.00* TR(35)
C      **** FROM COMMITTEE      TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C      **** S7 STEP  28 ****
C
C      **** FROM TRAFFIC      TO BUYER
563 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(57)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(54)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S7 STEP  29 ****
C
C      **** FROM TRAFFIC      TO BUYER
564 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(46)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(13)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME

```

```

C      **** S7 STEP 30 ****
C
C      **** FROM CONTRACTOR TO BUYER
565 ATT(6)=1
C      BUYER SERVICE TIME
ATT(42)= 1* TR(76)
C      **** FROM BUYER TO PCO
ATT(14)=1
C      PCO SERVICE TIME
ATT(43)= 1.10* TR(23)
C      **** FROM PCO TO TRAFFIC
ATT(36)=1
GOTO 9999
C
C      **** S7 STEP 31 ****
C
C      **** FROM TRAFFIC TO BUYER
566 ATT(6)=1
C      BUYER SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER TO CLERK
ATT(12)=1
C      CLERK SERVICE TIME
ATT(44)= .30* TR(5)
C      **** FROM CLERK TO REPRODUCTION
ATT(26)=1
C      REPRDUCTION SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999
C
C      **** S7 STEP 32 ****
C
C      **** FROM REPRODUCTION TO CLERK
567 ATT(10)=1
C      CLERK SERVICE TIME
ATT(44)= 1.00* TR(4)
C      **** FROM CLERK TO DISTRIBUTION
ATT(25)=1
C      DISTRIBUTION SERVICE TIME
ATT(52)= 12.00* TR(35)
GOTO 9999
568 GOTO 9999
569 GOTO 9999
570 GOTO 9999
571 GOTO 9999

```



```

572 GOTO 9999
573 GOTO 9999
574 GOTO 9999
575 GOTO 9999
C     END OF S7 NETWORK
C     **** S8 NETWORK ****
576 GOTO(577,578,579,580,581,582,583,584,585,586,587,588,
-589,590,591,592,593,594,595,596,597,598,599,600,
-601,602,603,604,605,606,607,608,609,610,611,612,
-613,614,615,616,617),STEP
C     **** S8 STEP 1 ****
C     **** FROM TRAFFIC      TO PCC
577 ATT(58)=1
C     PCC      SERVICE TIME
ATT(43)= 1.30* TR(33)
C     **** FROM PCC      TO BUYER
ATT(29)=1
C     BUYER      SERVICE TIME
ATT(42)= 15.00* TR(45)
C     **** FROM BUYER      TO CLERK
ATT(12)=1
C     CLERK      SERVICE TIME
ATT(44)= .60* TR(35)
C     **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C     **** S8 STEP 2 ****
C
C     **** FROM TRAFFIC      TO BUYER
578 ATT( 6)=1
C     BUYER      SERVICE TIME
ATT(42)= 1.50* TR(33)
C     **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999
C
C     **** S8 STEP 3 ****
C
C     **** FROM TRAFFIC      TO BUYER
579 ATT( 6)=1
C     BUYER      SERVICE TIME
ATT(42)= 12.00* TR(36)
C     **** FROM BUYER      TO CLERK
ATT(12)=1
C     CLERK      SERVICE TIME
ATT(44)= 5.00* TR(22)
C     **** FROM CLERK      TO TRAFFIC

```

```

C      ***** S8 STEP      4 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C      580 ATT( 6 )=1
C      BUYER      SERVICE TIME
C      ATT(42)= 2.00* TP(56)
C      ***** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .50* TR( 1)
C      ***** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999

```

```

C          ***** S8 STEP    5 *****
C
C          ***** FROM TRAFFIC          TO BUYER
C  S81 ATT( 5)=1
C          BUYER          SERVICE TIME
C  ATT(42)=    .50* TR(46)
C          ***** FROM BUYER          TO PCO
C  ATT(14)=1
C          PCO          SERVICE TIME
C  ATT(43)=  2.50* TP(23)
C          ***** FROM PCO          TO TRAFFIC
C  ATT(36)=1
C  GOTO 9999

```

```

C      **** S8 STEP    6 ****
C
C      *** FROM TRAFFIC      TO BUYER
C 582 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(56)
C      *** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.00* TP(51)
C      *** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTD 9999

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583 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCG
ATT(14)=1
C      PCG      SERVICE TIME
ATT(43)= .30* TR( 6)
C      **** FROM PCG      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** S8 STEP 8 ****
C
C      **** FROM TRAFFIC      TO BUYER
584 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO JAG
ATT(18)=1
C      JAG      SERVICE TIME
ATT(49)= 24.00* TR(35)
GOTO 9999

C
C      **** S8 STEP 9 ****
C
C      **** FROM JAG      TO BUYER
585 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** S8 STEP 10 ****
C
C      **** FROM TRAFFIC      TO BUYER
586 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .80* TR(33)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S8 STEP 11 ****

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```

C
C      **** FROM TRAFFIC      TO BUYER
587 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .50* TR(46)
C      **** FROM PCC      TO COMMITTEE
ATT(61)=1
C      COMMITTEE      SERVICE TIME
ATT(51)= 24.00* TR(45)
C      **** FROM COMMITTEE      TO TRAFFIC
ATT(38)=1
GOTO 9999

```

```

C
C      **** S8 STEP 12 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
588 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(57)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.00* TR(54)
C      **** FROM CLERK      TO TRAFFIC
ATT(23)=1
GOTO 9999

```

```

C
C      **** S8 STEP 13 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
599 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .80* TR(65)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .80* TR(65)
C      **** FROM PCC      TO MANAGEMENT
ATT(37)=1
C      MANAGEMENT      SERVICE TIME
ATT(54)= 24.00* TR(36)
GOTO 9999

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```

C
C      **** S8 STEP 14 ****

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```

C
C      **** FROM MANAGEMENT   TO BUYER
590 ATT( 6)=1
C      BUYER           SERVICE TIME
      ATT(42)= .50* TR( 6)
C      **** FROM BUYER       TO TRAFFIC
      ATT(16)=1
      GOTO 9999

C
C      **** S8 STEP  15 ****
C
C      **** FROM TRAFFIC     TO BUYER
591 ATT( 6)=1
C      BUYER           SERVICE TIME
      ATT(42)= 1.50* TR(66)
C      **** FROM BUYER      TO CLERK
      ATT(12)=1
C      CLERK           SERVICE TIME
      ATT(44)= 1.50* TR(45)
C      **** FROM CLERK      TO TRAFFIC
      ATT(28)=1
      GOTO 9999

C
C      **** S8 STEP  16 ****
C
C      **** FROM TRAFFIC     TO BUYER
592 ATT( 6)=1
C      BUYER           SERVICE TIME
      ATT(42)= 1.00* TR(58)
C      **** FROM BUYER      TO PCC
      ATT(14)=1
C      PCC             SERVICE TIME
      ATT(43)= .90* TR(44)
C      **** FROM PCC        TO CLERK
      ATT(33)=1
C      CLERK           SERVICE TIME
      ATT(44)= .50* TR(41)
C      **** FROM CLERK      TO REPRODUCTION
      ATT(26)=1
C      REPRODUCTION SERVICE TIME
      ATT(53)= 16.00* TR(54)
      GOTO 9999

C
C      **** S8 STEP  17 ****
C
C      **** FROM REPRODUCTION TO CLERK
593 ATT(10)=1
C      CLERK           SERVICE TIME

```

```

ATT(44)= 1.50* TP(44)
C      **** FROM CLERK          TO BUYER
ATT(21)=1
C      BUYER          SERVICE TIME
ATT(42)= 4.00* TP(56)
C      **** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** S8 STEP 18 ****
C
C      **** FROM TRAFFIC        TO CLERK
594 ATT(10)=1
C      CLERK          SERVICE TIME
ATT(44)= 1.00* TP(23)
C      **** FROM CLERK          TO BUYER
ATT(21)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TP(54)
C      **** FROM BUYER          TO PCC
ATT(14)=1
C      PCC          SERVICE TIME
ATT(43)= .50* TP(46)
C      **** FROM PCC          TO CONTRACTOR
ATT(35)=1
C      CONTRACTOR    SERVICE TIME
ATT(48)=176.00* TP(34)
GOTO 9999

C
C      **** S8 STEP 19 ****
C
C      **** FROM CONTRACTOR    TO BUYER
595 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TP(54)
C      **** FROM BUYER          TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL    SERVICE TIME
ATT(50)=104.00* TP(36)
GOTO 9999

C
C      **** S8 STEP 20 ****
C
C      **** FROM TECH.EVAL    TO BUYER
596 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 2.00* TP(55)
C      **** FROM BUYER          TO AUDIT

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```

C      ATT(20)=1
C      AUDIT      SERVICE TIME
C      ATT(55)=352.00* TR(54)
C      GOTO 9999
C
C      ***** S8 STEP 21 *****
C
C      ***** FROM AUDIT      TO BUYER
C 597 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 8.00* TR(34)
C      ***** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= 2.00* TR(34)
C      ***** FROM PCO      TO CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.00* TR(53)
C      ***** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      ***** S8 STEP 22 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 598 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.50* TR(36)
C      ***** FROM BUYER      TO TRAFFIC
C      ATT(16)=1
C      GOTO 9999
C
C      ***** S8 STEP 23 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 599 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 8.00* TR(55)
C      ***** FROM BUYER      TO TRAFFIC
C      ATT(16)=1
C      GOTO 9999
C
C      ***** S8 STEP 24 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 600 ATT( 6)=1
C      BUYER      SERVICE TIME

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```

      ATT(42)= 9.00* TR(35)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= 4.50* TR(23)
C      **** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTO 9999

C
C      **** S8 STEP 25 ****
C
C      **** FROM TRAFFIC        TO BUYER
601 ATT( 5)=1
C      BUYER          SERVICE TIME
      ATT(42)= 2.00* TR(54)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= .80* TR(33)
C      **** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTO 9999

C
C      **** S8 STEP 26 ****
C
C      **** FROM TRAFFIC        TO BUYER
602 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= .75* TR(33)
C      **** FROM BUYER          TO PCO
      ATT(14)=1
C      PCO          SERVICE TIME
      ATT(43)= 2.50* TR(23)
C      **** FROM PCO          TO TRAFFIC
      ATT(36)=1
      GOTO 9999

C
C      **** S8 STEP 27 ****
C
C      **** FROM TRAFFIC        TO BUYER
603 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= .50* TR(49)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= 1.00* TR(43)
C      **** FROM CLERK          TO TRAFFIC

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```

      ATT(28)=1
      GOTO 9999
C
C      ***** S8 STEP 28 *****
C
C      ***** FROM TRAFFIC          TO BUYER
604 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= .50* TR(66)
C      ***** FROM BUYER          TO PCO
      ATT(14)=1
C      PCO          SERVICE TIME
      ATT(43)= .50* TR( 7)
C      ***** FROM PCO          TO TRAFFIC
      ATT(36)=1
      GOTO 9999
C
C      ***** S8 STEP 29 *****
C
C      ***** FROM TRAFFIC          TO BUYER
605 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= .50* TP( 6)
C      ***** FROM BUYER          TO JAG
      ATT(18)=1
C      JAG          SERVICE TIME
      ATT(49)= 24.00* TR(35)
      GOTO 9999
C
C      ***** S8 STEP 30 *****
C
C      ***** FROM JAG          TO BUYER
606 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= .50* TR( 6)
C      ***** FROM BUYER          TO TRAFFIC
      ATT(16)=1
      GOTO 9999
C
C      ***** S8 STEP 31 *****
C
C      ***** FROM TRAFFIC          TO BUYER
607 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 1.50* TP(66)
C      ***** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME

```

```

ATT(44)= .80* TR(33)
C      **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S8 STEP 32 ****
C
C      **** FROM TRAFFIC        TO BUYER
608 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(34)
C      **** FROM BUYER          TO PCO
ATT(14)=1
C      PCO            SERVICE TIME
ATT(43)= .30* TR(37)
C      **** FROM PCO            TO COMMITTEE
ATT(51)=1
C      COMMITTEE      SERVICE TIME
ATT(51)= 24.00* TR(35)
C      **** FROM COMMITTEE      TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C      **** S8 STEP 33 ****
C
C      **** FROM TRAFFIC        TO BUYER
609 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 2.00* TR(57)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= 1.00* TR(54)
C      **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** S8 STEP 34 ****
C
C      **** FROM TRAFFIC        TO BUYER
610 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER          TO PCO
ATT(14)=1
C      PCO            SERVICE TIME
ATT(43)= .50* TR(46)
C      **** FROM PCO            TO TRAFFIC

```

```

ATT(36)=1
GOTO 9999

C
C      ***** S8 STEP 35 *****
C
C      ***** FROM TRAFFIC      TO BUYER
611 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      ***** FROM BUYER      TO COMMITTEE
ATT(15)=1
C      COMMITTEE  SERVICE TIME
ATT(51)= 32.00* TR(65)
C      ***** FROM COMMITTEE  TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C      ***** S8 STEP 36 *****
C
C      ***** FROM TRAFFIC      TO BUYER
612 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR( 6)
C      ***** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      ***** S8 STEP 37 *****
C
C      ***** FROM TRAFFIC      TO BUYER
613 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.50* TR(46)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(44)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      ***** S8 STEP 38 *****
C
C      ***** FROM TRAFFIC      TO BUYER
614 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      ***** FROM BUYER      TO PCC

```

```

ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(54)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(13)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)= 80.00* TR(56)
GOTO 9999

C
C      **** S8 STEP 39 ****
C
C      **** FROM CONTRACTOR      TO BUYER
615 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .70* TR(27)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(55)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** S8 STEP 40 ****
C
C      **** FROM TRAFFIC      TO BUYER
616 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(83)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR( 5)
C      **** FROM CLERK      TO REPRODUCTION
ATT(26)=1
C      REPRODUCTION SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999

C
C      **** S8 STEP 41 ****
C
C      **** FROM REPRODUCTION TO CLERK
617 ATT(10)=1
C      CLERK      SERVICE TIME

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```

C      ATT(44)= 1.00* TR( 4)
C      **** FROM CLERK      TO DISTRIBUTION
C      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
C      ATT(52)= 12.00* TR(35)
C      GOTO 9999
C      END OF S6 NETWORK
C      **** C9 NETWORK ****
618 GOTO(619,620,621,622,623,624,625,626,627,628,629,630,
    *631,632,633,634,635,636,637,638,639,640,641,642,
    *643,644,645,646,647,648,649,650,651,652,653,654,
    *655,656,657,658),STEP
C      **** C9 STEP  1 ****
C      **** FROM TRAFFIC    TO BUYER
619 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 12.00* TR(55)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 11.00* TR(22)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** C9 STEP  2 ****
C
C      **** FROM TRAFFIC    TO BUYER
620 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)=  2.00* TR(57)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)=  1.00* TR(48)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** C9 STEP  3 ****
C
C      **** FROM TRAFFIC    TO BUYER
621 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)=  1.00* TR(54)
C      **** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME

```

C ATT(43)= 3.00* TR(63)
 C **** FROM PCO TO TRAFFIC
 C ATT(36)=1
 C GOTO 9999

C
 C **** C9 STEP 4 ****

C **** FROM TRAFFIC TO BUYER
 C 622 ATT(5)=1
 C BUYER SERVICE TIME
 C ATT(42)= 1.00* TR(56)
 C **** FROM BUYER TO CLERK
 C ATT(12)=1
 C CLERK SERVICE TIME
 C ATT(44)= 1.00* TR(46)
 C **** FROM CLERK TO TRAFFIC
 C ATT(29)=1
 C GOTO 9999

C
 C **** C9 STEP 5 ****

C **** FROM TRAFFIC TO BUYER
 C 623 ATT(5)=1
 C BUYER SERVICE TIME
 C ATT(42)= .50* TP(56)
 C **** FROM BUYER TO PCO
 C ATT(14)=1
 C PCO SERVICE TIME
 C ATT(43)= .30* TP(67)
 C **** FROM PCO TO TRAFFIC
 C ATT(36)=1
 C GOTO 9999

C
 C **** C9 STEP 6 ****

C **** FROM TRAFFIC TO BUYER
 C 624 ATT(5)=1
 C BUYER SERVICE TIME
 C ATT(42)= .50* TR(6)
 C **** FROM BUYER TO JAG
 C ATT(18)=1
 C JAG SERVICE TIME
 C ATT(49)= 24.00* TP(36)
 C GOTO 9999

C
 C **** C9 STEP 7 ****

C **** FROM JAG TO BUYER

```

625 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .50* TR( 6)
C      **** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** C9 STEP   8 ****
C
C      **** FROM TRAFFIC          TO BUYER
626 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(58)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .50* TR(46)
C      **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** C9 STEP   9 ****
C
C      **** FROM TRAFFIC          TO BUYER
627 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .30* TR(33)
C      **** FROM BUYER          TO PCC
ATT(14)=1
C      PCO          SERVICE TIME
ATT(43)= .80* TR(33)
C      **** FROM PCC          TO COMMITTEE
ATT(61)=1
C      COMMITTEE          SERVICE TIME
ATT(51)= 24.00* TR(56)
C      **** FROM COMMITTEE          TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C      **** C9 STEP  10 ****
C
C      **** FROM TRAFFIC          TO BUYER
628 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 3.00* TR(65)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME

```

```

ATT(44)= 2.00* TR(34)
C      **** FROM CLERK      TO TRAFFIC
ATT(29)=1
GOTO 9999

C
C      **** C9 STEP 11 ****
C
C      **** FROM TRAFFIC      TO BUYER
629 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(36)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(45)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(53)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)= 80.00* TR(54)
GOTO 9999

C
C      **** C9 STEP 12 ****
C
C      **** FROM CONTRACTOR      TO BUYER
630 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(27)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** C9 STEP 13 ****
C
C      **** FROM TRAFFIC      TO BUYER
631 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(76)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME

```



```

      ATT(44)= .30* TR( 1)
C      **** FROM CLERK          TO REPRODUCTION
      ATT(26)=1
C      REPRODUCTION SERVICE TIME
      ATT(53)= 16.00* TR(54)
      GOTO 9999

C
C      **** C9 STEP 14 ****
C
C      **** FROM REPRODUCTION TO CLERK
632 ATT(10)=1
C      CLERK          SERVICE TIME
      ATT(44)= 2.00* TR(24)
C      **** FROM CLERK          TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTO 9999
633 GOTO 9999
634 GOTO 9999
635 GOTO 9999
636 GOTO 9999
637 GOTO 9999
638 GOTO 9999
639 GOTO 9999
640 GOTO 9999
641 GOTO 9999
642 GOTO 9999
643 GOTO 9999
644 GOTO 9999
645 GOTO 9999
646 GOTO 9999
647 GOTO 9999
648 GOTO 9999
649 GOTO 9999
650 GOTO 9999
651 GOTO 9999
652 GOTO 9999
653 GOTO 9999
654 GOTO 9999
655 GOTO 9999
656 GOTO 9999
657 GOTO 9999
658 GOTO 9999
C      END OF C9 NETWORK
C      **** F1 NETWORK ****
659 GOTO(660,661,662,663,664,665,666,667,668,669,670,671,
      *672,673,674,675,676,677,678,679,680,681,682,683,

```

*684,685,686,687,688,689,690,691,692,693,694,695,
*696,697,698,699),STEP

C ***** F1 STEP 1 *****
C ***** FROM TRAFFIC TO BUYER
660 ATT(6)=1
C BUYER SERVICE TIME
ATT(42)= .50* TR(46)
C ***** FROM BUYER TO CLERK
ATT(12)=1
C CLERK SERVICE TIME
ATT(44)= .60* TR(34)
C ***** FROM CLERK TO TRAFFIC
ATT(28)=1
GOTO 9999

C ***** F1 STEP 2 *****
C ***** FROM TRAFFIC TO BUYER
661 ATT(6)=1
C BUYER SERVICE TIME
ATT(42)= .50* TR(46)
C ***** FROM BUYER TO CLERK
ATT(12)=1
C CLERK SERVICE TIME
ATT(44)= .20* TR(34)
C ***** FROM CLERK TO TRAFFIC
ATT(28)=1
GOTO 9999

C ***** F1 STEP 3 *****
C ***** FROM TRAFFIC TO BUYER
662 ATT(6)=1
C BUYER SERVICE TIME
ATT(42)= .25* TR(9)
C ***** FROM BUYER TO PCO
ATT(14)=1
C PCO SERVICE TIME
ATT(43)= .30* TR(35)
C ***** FROM PCO TO COMMITTEE
ATT(61)=1
C COMMITTEE SERVICE TIME
ATT(51)= 16.00* TR(57)
C ***** FROM COMMITTEE TO CLERK
ATT(40)=1
C CLERK SERVICE TIME
ATT(44)= .10* TR(1)
C ***** FROM CLERK TO TRAFFIC

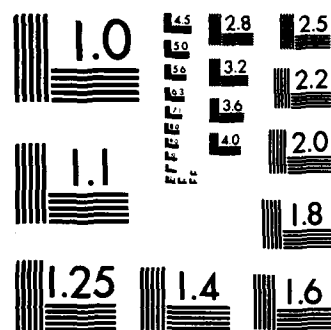
Q-GERT MODEL OF THE CONTRACTING CYCLE(U) AIR FORCE INST 4/8
OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYSTEMS AND
LOGISTICS C D. MILLER SEP 83 AFIT-LSSR-118-83

4/8.

F/G 5/1

NL

[illegible]



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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ATT(28)=1
GOTO 9999

C
C
C
C
C      **** F1 STEP 4 ****
C
C      **** FROM TRAFFIC      TO BUYER
663 ATT(6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO FCC
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .20* TR(54)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= .20* TR(54)
C      **** FROM CLERK      TO REPRODUCTION
ATT(26)=1
C      REPRODUCTION SERVICE TIME
ATT(53)= 15.00* TR(54)
GOTO 9999

C
C
C
C
C      **** F1 STEP 5 ****
C
C      **** FROM REPRODUCTION TO CLERK
664 ATT(10)=1
C      CLERK      SERVICE TIME
ATT(44)= .20* TR(54)
C      **** FROM CLERK      TO DISTRIBUTION
ATT(25)=1
C      DISTRIBUTION SERVICE TIME
ATT(52)= 12.00* TR(35)
GOTO 9999
665 GOTO 9999
666 GOTO 9999
667 GOTO 9999
668 GOTO 9999
669 GOTO 9999
670 GOTO 9999
671 GOTO 9999
672 GOTO 9999
673 GOTO 9999
674 GOTO 9999
675 GOTO 9999
676 GOTO 9999
677 GOTO 9999
678 GOTO 9999

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679 GOTO 9999
680 GOTO 9999
681 GOTO 9999
682 GOTO 9999
683 GOTO 9999
684 GOTO 9999
685 GOTO 9999
686 GOTO 9999
687 GOTO 9999
688 GOTO 9999
689 GOTO 9999
690 GOTO 9999
691 GOTO 9999
692 GOTO 9999
693 GOTO 9999
694 GOTO 9999
695 GOTO 9999
696 GOTO 9999
697 GOTO 9999
698 GOTO 9999
699 GOTO 9999
C      END OF F1 NETWORK
C      **** M2 NETWORK ****
700 GOTO(701,702,703,704,705,706,707,708,709,710,711,712,
      *713,714,715,716,717,718,719,720,721,722,723,724,
      *725,726,727,728),STEP
C      **** M2 STEP 1 ****
C      **** FROM TRAFFIC      TO BUYER
701 ATT(6)=1
C      BUYER      SERVICE TIME
      ATT(42)= 4.00* TR(56)
C      **** FROM BUYER      TO CLERK
      ATT(12)=1
C      CLERK      SERVICE TIME
      ATT(44)= .80* TR(35)
C      **** FROM CLERK      TO TRAFFIC
      ATT(28)=1
      GOTO 9999
C
C      **** M2 STEP 2 ****
C
C      **** FROM TRAFFIC      TO BUYER
702 ATT(6)=1
C      BUYER      SERVICE TIME
      ATT(42)= 1.00* TR(51)
C      **** FROM BUYER      TO CLERK
      ATT(12)=1
C      CLERK      SERVICE TIME

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```

C      ATT(44)= .50* TR(46)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** M2 STEP  3 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 703 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .50* TR(46)
C      **** FROM PCO      TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      **** M2 STEP  4 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 704 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .30* TR(35)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** M2 STEP  5 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 705 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .30* TR(35)
C      **** FROM PCO      TO CONTRACTOR
C      ATT(35)=1
C      CONTRACTOR      SERVICE TIME
C      ATT(46)=176.00* TR(34)
C      GOTO 9999

```

```

C
C      ***** M2 STEP   6. *****
C
C      ***** FROM CONTRACTOR   TO BUYER
706 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(34)
C      ***** FROM BUYER          TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL      SERVICE TIME
ATT(50)=104.00* TR(36)
GOTO 9999
C
C      ***** M2 STEP   7 *****
C
C      ***** FROM TECH.EVAL   TO BUYER
707 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 2.00* TR(55)
C      ***** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999
C
C      ***** M2 STEP   8 *****
C
C      ***** FROM TRAFFIC      TO BUYER
708 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 3.00* TR(36)
C      ***** FROM BUYER          TO PCC
ATT(14)=1
C      PCC           SERVICE TIME
ATT(43)= .50* TR(45)
C      ***** FROM PCC           TO TRAFFIC
ATT(36)=1
GOTO 9999
C
C      ***** M2 STEP   9 *****
C
C      ***** FROM TRAFFIC      TO BUYER
709 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.50* TR(37)
C      ***** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999
C
C      ***** M2 STEP  10 *****

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C
C      **** FROM TRAFFIC      TO BUYER
710 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(35)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.00* TR(54)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      **** M2 STEP  11 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
711 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(45)
C      **** FROM CLERK      TO TRAFFIC
ATT(29)=1
GOTO 9999

```

```

C
C      **** M2 STEP  12 ****
C

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```

C      **** FROM TRAFFIC      TO BUYER
712 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .75* TR(33)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(26)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      **** M2 STEP  13 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
713 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)
C      **** FROM BUYER      TO CLERK

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```

C      ATT(12)=1
C      CLERK      . SERVICE TIME
C      ATT(44)= .30* TR(36)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** M2 STEP 14 ****
C
C      **** FROM TRAFFIC      TO BUYER
714 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= .50* TR(66)
C      **** FROM BUYER      TO PCC
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .50* TR(46)
C      **** FROM PCO      TO CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .50* TR(25)
C      **** FROM CLERK      TO CONTRACTOR
C      ATT(27)=1
C      CONTRACTOR SERVICE TIME
C      ATT(43)= 30.00* TR(54)
C      GOTO 9999
C
C      **** M2 STEP 15 ****
C
C      **** FROM CONTRACTOR TO BUYER
715 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(53)
C      **** FROM BUYER      TO PCC
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .30* TR(31)
C      **** FROM PCC      TO CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .20* TR( 4)
C      **** FROM CLERK      TO REPRODUCTION
C      ATT(26)=1
C      REPRODUCTION SERVICE TIME
C      ATT(53)= 16.00* TR(54)
C      GOTO 9999
C
C      **** M2 STEP 16 ****

```

```

C
C      **** FROM REPRODUCTION TO CLERK
716 ATT(10)=1
C      CLERK          SERVICE TIME
      ATT(44)= .30* TR( 3)
C      **** FROM CLERK          TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTJ 9999
717 GOTJ 9999
718 GOTJ 9999
719 GOTJ 9999
720 GOTJ 9999
721 GOTJ 9999
722 GOTJ 9999
723 GOTJ 9999
724 GOTJ 9999
725 GOTJ 9999
726 GOTJ 9999
727 GOTJ 9999
728 GOTJ 9999
C      END OF M2 NETWORK
C      **** M3 NETWORK ****
729 GOTJ(730,731,732,733,734,735,736,737,738,739,740,741,
      *742,743,744,745,746,747,748,749,750,751,752,753,
      *754,755,756,757),STEP
C      **** M3 STEP 1 ****
C      **** FROM TRAFFIC          TO BUYER
730 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 6.00* TR(53)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= .50* TR(45)
C      **** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTJ 9999
C
C      **** M3 STEP 2 ****
C
C      **** FROM TRAFFIC          TO BUYER
731 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 1.00* TR(51)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1

```

```

C          CLERK          SERVICE TIME
ATT(44)= .50* TR(46)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          **** M3 STEP   3 ****
C
C          **** FROM TRAFFIC          TO BUYER
732 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= .40* TR(25)
C          **** FROM PCC          TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C          **** M3 STEP   4 ****
C
C          **** FROM TRAFFIC          TO BUYER
733 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(56)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= .30* TR(35)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          **** M3 STEP   5 ****
C
C          **** FROM TRAFFIC          TO BUYER
734 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= .30* TR(35)
C          **** FROM PCC          TO CONTRACTOR
ATT(35)=1
C          CONTRACTOR          SERVICE TIME
ATT(48)=17*.00* TR(34)

```

```

C      GOTO 9999
C
C      **** M3 STEP  6 ****
C
C      **** FROM CONTRACTOR  TO BUYER
735 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER          TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL      SERVICE TIME
ATT(50)=134.00* TR(36)
GOTO 9999
C
C      **** M3 STEP  7 ****
C
C      **** FROM TECH.EVAL  TO BUYER
736 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 2.00* TR(55)
C      **** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999
C
C      **** M3 STEP  8 ****
C
C      **** FROM TRAFFIC  TO BUYER
737 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 3.00* TR(36)
C      **** FROM BUYER          TO PCO
ATT(14)=1
C      PCO          SERVICE TIME
ATT(43)= .50* TR(44)
C      **** FROM PCO          TO TRAFFIC
ATT(36)=1
GOTO 9999
C
C      **** M3 STEP  9 ****
C
C      **** FROM TRAFFIC  TO BUYER
738 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 2.00* TR(55)
C      **** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999
C

```

```

C      ***** M3 STEP 10 *****
C
C      ***** FROM TRAFFIC      TO BUYER
739 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(35)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.00* TR(54)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      ***** M3 STEP 11 *****
C
C      ***** FROM TRAFFIC      TO BUYER
740 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.30* TR(36)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(45)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      ***** M3 STEP 12 *****
C
C      ***** FROM TRAFFIC      TO BUYER
741 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= .75* TR(33)
C      ***** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= 2.00* TR(45)
C      ***** FROM PCC      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      ***** M3 STEP 13 *****
C
C      ***** FROM TRAFFIC      TO BUYER
742 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)

```

C **** FROM BUYER TO CLERK
 ATT(12)=1
 C CLERK SERVICE TIME
 ATT(44)= .30* TR(36)
 C **** FROM CLERK TO TRAFFIC
 ATT(28)=1
 GOTO 9999

C
 C ***** M3 STEP 14 *****
 C

C **** FROM TRAFFIC TO BUYER
 743 ATT(6)=1
 C BUYER SERVICE TIME
 ATT(42)= .50* TR(66)
 C **** FROM BUYER TO
 ATT(14)=1
 C PCO SERVICE TIME
 ATT(43)= .50* TP(46)
 C **** FROM PCO TO TRAFFIC
 ATT(36)=1
 GOTO 9999

C
 C ***** M3 STEP 15 *****
 C

C **** FROM TRAFFIC TO BUYER
 744 ATT(6)=1
 C BUYER SERVICE TIME
 ATT(42)= .80* TP(33)
 C **** FROM BUYER TO JAG
 ATT(18)=1
 C JAG SERVICE TIME
 ATT(49)= 24.00* TR(55)
 GOTO 9999

C
 C ***** M3 STEP 16 *****
 C

C **** FROM JAG TO BUYER
 745 ATT(6)=1
 C BUYER SERVICE TIME
 ATT(42)= .50* TP(33)
 C **** FROM BUYER TO TRAFFIC
 ATT(15)=1
 GOTO 9999

C
 C ***** M3 STEP 17 *****
 C

C **** FROM TRAFFIC TO BUYER
 746 ATT(6)=1

```

C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR( 3)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** M3 STEP 16 ****
C
C      **** FROM TRAFFIC      TO BUYER
747 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .40* TR(56)
C      **** FROM PCC      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(25)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(46)= 30.00* TR(54)
GOTO 9999

C
C      **** M3 STEP 19 ****
C
C      **** FROM CONTRACTOR      TO BUYER
748 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(53)
C      **** FROM BUYER      TO FCC
ATT(14)=1
C      FCC      SERVICE TIME
ATT(43)= .30* TR(31)
C      **** FROM FCC      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= .20* TR( 4)
C      **** FROM CLERK      TO REPRODUCTION
ATT(26)=1
C      REPRODUCTION      SERVICE TIME
ATT(53)= 15.00* TR(54)

```



```

      GOTO 9999
C
C      **** M3 STEP 20 ****
C
C      **** FROM REPRODUCTION TO CLERK
749 ATT(10)=1
C      CLERK          SERVICE TIME
      ATT(44)= .30* TR(3)
C      **** FROM CLERK          TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTO 9999
750 GOTO 9999
751 GOTO 9999
752 GOTO 9999
753 GOTO 9999
754 GOTO 9999
755 GOTO 9999
756 GOTO 9999
757 GOTO 9999
C      END OF M3 NETWORK
C      **** M4 NETWORK ****
758 GOTO(759,760,761,762,763,764,765,766,767,768,769,770,
      *771,772,773,774,775,776,777,778,779,780,781,782,
      *783,784,785,786),STEP
C      **** M4 STEP 1 ****
C      **** FROM TRAFFIC          TO BUYER
759 ATT( 5)=1
C      BUYER          SERVICE TIME
      ATT(42)= 4.00* TR(26)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= .50* TR(45)
C      **** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTO 9999
C
C      **** M4 STEP 2 ****
C
C      **** FROM TRAFFIC          TO BUYER
760 ATT( 5)=1
C      BUYER          SERVICE TIME
      ATT(42)= 1.00* TR(53)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME

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```

C      ATT(44)= .50* TR(46)
C      **** FROM CLERK          TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** M4 STEP 3 ****
C
C      **** FROM TRAFFIC        TO BUYER
C 761 ATT( 6)=1
C      BUYER          SERVICE TIME
C      ATT(42)= .50* TR(46)
C      **** FROM BUYER          TO PCO
C      ATT(14)=1
C      PCO            SERVICE TIME
C      ATT(43)= .50* TR(44)
C      **** FROM PCO            TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      **** M4 STEP 4 ****
C
C      **** FROM TRAFFIC        TO BUYER
C 762 ATT( 5)=1
C      BUYER          SERVICE TIME
C      ATT(42)= 1.00* TR(56)
C      **** FROM BUYER          TO CLERK
C      ATT(12)=1
C      CLERK          SERVICE TIME
C      ATT(44)= .30* TR(35)
C      **** FROM CLERK          TO TRAFFIC
C      ATT(29)=1
C      GOTO 9999
C
C      **** M4 STEP 5 ****
C
C      **** FROM TRAFFIC        TO BUYER
C 763 ATT( 6)=1
C      BUYER          SERVICE TIME
C      ATT(42)= .50* TR(46)
C      **** FROM BUYER          TO PCO
C      ATT(14)=1
C      PCO            SERVICE TIME
C      ATT(43)= .30* TR(35)
C      **** FROM PCO            TO CONTRACTOR
C      ATT(35)=1
C      CONTRACTOR     SERVICE TIME
C      ATT(48)=176.00* TR(34)
C      GOTO 9999

```

```

C
C      ***** M4 STEP   6 *****
C
C      ***** FROM CONTRACTOR   TO BUYER
764 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      ***** FROM BUYER      TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL   SERVICE TIME
ATT(50)=104.00* TR(36)
GOTO 9999

C
C      ***** M4 STEP   7 *****
C
C      ***** FROM TECH.EVAL   TO BUYER
765 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(55)
C      ***** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      ***** M4 STEP   8 *****
C
C      ***** FROM TRAFFIC     TO BUYER
766 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 4.00* TR(34)
C      ***** FROM BUYER      TO PCC
ATT(14)=1
C      PCO        SERVICE TIME
ATT(43)= .50* TR(45)
C      ***** FROM PCC        TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      ***** M4 STEP   9 *****
C
C      ***** FROM TRAFFIC     TO BUYER
767 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(55)
C      ***** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      ***** M4 STEP  10 *****

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```

C
C      **** FROM TRAFFIC      TO BUYER
768 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 5.00* TR(22)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.30* TR(44)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      **** M4 STEP 11 ****
C

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```

C      **** FROM TRAFFIC      TO BUYER
769 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.50* TR(46)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(45)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      **** M4 STEP 12 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
770 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .75* TR(33)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(45)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      **** M4 STEP 13 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
771 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)
C      **** FROM BUYER      TO CLERK

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```

ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR(36)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9599

C
C      **** M4 STEP 14 ****
C
C      **** FROM TRAFFIC      TO BUYER
772 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(66)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(46)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** M4 STEP 15 ****
C
C      **** FROM TRAFFIC      TO BUYER
773 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .80* TR(33)
C      **** FROM BUYER      TO JAG
ATT(18)=1
C      JAG      SERVICE TIME
ATT(49)= 24.00* TR(55)
GOTO 9599

C
C      **** M4 STEP 16 ****
C
C      **** FROM JAG      TO BUYER
774 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .80* TR(33)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** M4 STEP 17 ****
C
C      **** FROM TRAFFIC      TO BUYER
775 ATT( 6)=1
C      BUYER      SERVICE TIME

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```

C      ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .30* TR( 3)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** M4 STEP 18 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 776 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCC
C      ATT(14)=1
C      PCC      SERVICE TIME
C      ATT(43)= .40* TR(56)
C      **** FROM PCC      TO CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .50* TR(25)
C      **** FROM CLERK      TO CONTRACTOR
C      ATT(27)=1
C      CONTRACTOR      SERVICE TIME
C      ATT(46)= 80.00* TR(54)
C      GOTO 9999
C
C      **** M4 STEP 19 ****
C
C      **** FROM CONTRACTOR      TO BUYER
C 777 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCC
C      ATT(14)=1
C      PCC      SERVICE TIME
C      ATT(43)= .30* TR(33)
C      **** FROM PCC      TO CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .20* TR( 4)
C      **** FROM CLERK      TO REPRODUCTION
C      ATT(26)=1
C      REPRODUCTION      SERVICE TIME
C      ATT(53)= 16.00* TR(54)
C      GOTO 9999

```

```

C
C      ***** M4 STEP 20.*****
C
C      ***** FROM REPRODUCTION TO CLERK
778 ATT(10)=1
C      CLERK          SERVICE TIME
      ATT(44)= .30* TR( 3)
C      ***** FROM CLERK          TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTO 9999
779 GOTO 9999
780 GOTO 9999
781 GOTO 9999
782 GOTO 9999
783 GOTO 9999
784 GOTO 9999
785 GOTO 9999
786 GOTO 9999
C      END OF M4 NETWORK
C      ***** M5 NETWORK *****
787 GOTO(788,789,790,791,792,793,794,795,796,797,798,799,
      *800,801,802,803,804,805,806,807,808,809,810,811,
      *812,813,814,815),STEP
C      ***** M5 STEP 1 *****
C      ***** FROM TRAFFIC          TO BUYER
788 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 7.00* TR(12)
C      ***** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= .50* TR(45)
C      ***** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTO 9999
C
C      ***** M5 STEP 2 *****
C
C      ***** FROM TRAFFIC          TO BUYER
789 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 1.50* TR(46)
C      ***** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= .50* TR(46)

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C      **** FROM CLERK          TO TRAFFIC
ATT(23)=1
GOTO 9999

C
C      **** M5 STEP   3 ****
C
C      **** FROM TRAFFIC        TO BUYER
790 ATT( 6)=1
      BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER          TO PCO
ATT(14)=1
C      PCO           SERVICE TIME
ATT(43)= .50* TR(46)
C      **** FROM PCO           TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** M5 STEP   4 ****
C
C      **** FROM TRAFFIC        TO BUYER
791 ATT( 6)=1
      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .30* TR(35)
C      **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** M5 STEP   5 ****
C
C      **** FROM TRAFFIC        TO BUYER
792 ATT( 6)=1
      BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER          TO PCO
ATT(14)=1
C      PCO           SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PCO           TO CONTRACTOR
ATT(35)=1
C      CONTRACTOR    SERVICE TIME
ATT(46)=176.00* TR(34)
GOTO 9999

C

```



```

C      **** M5 STEP  6 ****
C
C      **** FROM CONTRACTOR  TO BUYER
793 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL  SERVICE TIME
ATT(53)=104.00* TR(36)
GOTO 9999

C
C      **** M5 STEP  7 ****
C
C      **** FROM TECH.EVAL  TO BUYER
794 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(55)
C      **** FROM BUYER      TO TRAFFIC
ATT(15)=1
GOTO 9999

C
C      **** M5 STEP  8 ****
C
C      **** FROM TRAFFIC    TO BUYER
795 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 5.00* TR(22)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(45)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** M5 STEP  9 ****
C
C      **** FROM TRAFFIC    TO BUYER
796 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.50* TR(64)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** M5 STEP 10 ****
C

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```

C      **** FROM TRAFFIC      TO BUYER
797 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 5.00* TR(22)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.30* TR(44)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      **** M5 STEP 11 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
798 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(54)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(45)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      **** M5 STEP 12 ****
C

```

```

C      **** FROM TRAFFIC      TO BUYER
799 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .75* TR(33)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.30* TR(35)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      **** M5 STEP 13 ****
C

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```

C      **** FROM TRAFFIC      TO BUYER
800 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)
C      **** FROM BUYER      TO CLERK
ATT(12)=1

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C      CLERK      SERVICE TIME
ATT(44)= .30* TR(36)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** M5 STEP 14 ****
C
C      **** FROM TRAFFIC      TO BUYER
801 ATT( 5)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(66)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(46)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** M5 STEP 15 ****
C
C      **** FROM TRAFFIC      TO BUYER
802 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .80* TR(33)
C      **** FROM BUYER      TO JAG
ATT(18)=1
C      JAG      SERVICE TIME
ATT(49)= 24.00* TR(55)
GOTO 9999

C
C      **** M5 STEP 16 ****
C
C      **** FROM JAG      TO BUYER
803 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .80* TR(33)
C      **** FROM BUYER      TO TRAFFIC
ATT(15)=1
GOTO 9999

C
C      **** M5 STEP 17 ****
C
C      **** FROM TRAFFIC      TO BUYER
804 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)

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C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= .30* TR( 3)
C      **** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTO 9999

C
C      **** M5 STEP 16 ****
C
C      **** FROM TRAFFIC        TO BUYER
805 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 1.00* TR(54)
C      **** FROM BUYER          TO PCO
      ATT(14)=1
C      PCO          SERVICE TIME
      ATT(43)= .40* TR(56)
C      **** FROM PCO          TO COMMITTEE
      ATT(51)=1
C      COMMITTEE    SERVICE TIME
      ATT(51)= 24.00* TR(35)
C      **** FROM COMMITTEE    TO TRAFFIC
      ATT(38)=1
      GOTO 9999

C
C      **** M5 STEP 19 ****
C
C      **** FROM TRAFFIC        TO BUYER
806 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 2.00* TR(74)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= .80* TR(33)
C      **** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTO 9999

C
C      **** M5 STEP 20 ****
C
C      **** FROM TRAFFIC        TO BUYER
807 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 1.00* TR(51)
C      **** FROM BUYER          TO PCO
      ATT(14)=1

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C      PCO      SERVICE TIME
ATT(43)= .50* TR(46)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME ,
ATT(44)= .50* TR(25)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)= 80.00* TR(54)
GOTO 9999

C
C      **** M5 STEP 21 ****
C
C      **** FROM CONTRACTOR      TO BUYER
808 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(33)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PCO      TO CLERK
ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= .20* TR( 4)
C      **** FROM CLERK      TO REPRODUCTION
ATT(26)=1
C      REPRODUCTION      SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999

C
C      **** M5 STEP 22 ****
C
C      **** FROM REPRODUCTION      TO CLERK
809 ATT(10)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR( 3)
C      **** FROM CLERK      TO DISTRIBUTION
ATT(25)=1
C      DISTRIBUTION      SERVICE TIME
ATT(52)= 12.00* TP(35)
GOTO 9999
810 GOTO 9999
811 GOTO 9999
812 GOTO 9999
813 GOTO 9999
814 GOTO 9999

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```

815 GOTO 9999
C   END OF M5 NETWORK
C   **** M5 NETWORK ****
816 GOTO(817,818,819,820,821,822,823,824,825,826,827,828,
    *829,830,831,832,833,834,835,836,837,838,839,840,
    *841,842,843,844),STEP
C   **** M5 STEP 1 ****
C   **** FROM TRAFFIC TO BUYER
817 ATT(6)=1
C   BUYER SERVICE TIME
ATT(42)= 4.00* TR(36)
C   **** FROM BUYER TO CLERK
ATT(12)=1
C   CLERK SERVICE TIME
ATT(44)= .60* TR(14)
C   **** FROM CLERK TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C   **** M6 STEP 2 ****
C   **** FROM TRAFFIC TO BUYER
818 ATT(6)=1
C   BUYER SERVICE TIME
ATT(42)= .80* TR(23)
C   **** FROM BUYER TO CLERK
ATT(12)=1
C   CLERK SERVICE TIME
ATT(44)= .50* TR(46)
C   **** FROM CLERK TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C   **** M5 STEP 3 ****
C   **** FROM TRAFFIC TO BUYER
819 ATT(6)=1
C   BUYER SERVICE TIME
ATT(42)= .50* TR(46)
C   **** FROM BUYER TO PCC
ATT(14)=1
C   PCC SERVICE TIME
ATT(43)= .80* TR(35)
C   **** FROM PCC TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C   **** M5 STEP 4 ****

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```

C
C      **** FROM TRAFFIC      TO BUYER
820 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR(35)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** MS STEP 5 ****
C
C      **** FROM TRAFFIC      TO BUYER
821 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO FCC
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PCO      TO CONTRACTOR
ATT(35)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)=176.00* TR(34)
GOTO 9999

C
C      **** MS STEP 6 ****
C
C      **** FROM CONTRACTOR      TO BUYER
822 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL      SERVICE TIME
ATT(50)=104.00* TR(36)
GOTO 9999

C
C      **** MS STEP 7 ****
C
C      **** FROM TECH.EVAL      TO BUYER
823 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(55)
C      **** FROM BUYER      TO AUDIT

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ATT(20)=1
C      AUDIT      SERVICE TIME
ATT(55)=352.00* TR(54)
GOTO 9999

C
C      ***** M6 STEP 8 *****
C
C      ***** FROM AUDIT      TO BUYER
824 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 6.00* TR(56)
C      ***** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .80* TR(35)
C      ***** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      ***** M6 STEP 9 *****
C
C      ***** FROM TRAFFIC      TO BUYER
825 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(56)
C      ***** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      ***** M6 STEP 10 *****
C
C      ***** FROM TRAFFIC      TO BUYER
826 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 6.00* TR(35)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 2.30* TR(44)
C      ***** FROM CLERK      TO TRAFFIC
ATT(29)=1
GOTO 9999

C
C      ***** M6 STEP 11 *****
C
C      ***** FROM TRAFFIC      TO BUYER
827 ATT( 6)=1
C      BUYER      SERVICE TIME

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```

      ATT(42)= 2.00* TR(56)
C      **** FROM BUYER.          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= .50* TR(45)
C      **** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTO 9999

C
C      **** M6 STEP 12 ****
C
C      **** FROM TRAFFIC          TO BUYER
828 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= .75* TR(33)
C      **** FROM BUYER          TO PCO
      ATT(14)=1
C      PCO          SERVICE TIME
      ATT(43)= 1.00* TR(26)
C      **** FROM PCO          TO TRAFFIC
      ATT(36)=1
      GOTO 9999

C
C      **** M6 STEP 13 ****
C
C      **** FROM TRAFFIC          TO BUYER
829 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= .50* TR(45)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= .30* TR(36)
C      **** FROM CLERK          TO TRAFFIC
      ATT(28)=1
      GOTO 9999

C
C      **** M6 STEP 14 ****
C
C      **** FROM TRAFFIC          TO BUYER
830 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= .50* TR(66)
C      **** FROM BUYER          TO PCO
      ATT(14)=1
C      PCO          SERVICE TIME
      ATT(43)= .50* TR(46)
C      **** FROM PCO          TO TRAFFIC

```

ATT(36)=1
GOTO 9999

C
C ***** M6 STEP 15 *****
C
C ***** FROM TRAFFIC TO BUYER
C 831 ATT(6)=1
C BUYER SERVICE TIME
C ATT(42)= .80* TR(33)
C ***** FROM BUYER TO JAG
C ATT(18)=1
C JAG SERVICE TIME
C ATT(49)= 24.00* TR(55)
C GOTO 9999

C
C ***** M6 STEP 16 *****
C
C ***** FROM JAG TO BUYER
C 832 ATT(6)=1
C BUYER SERVICE TIME
C ATT(42)= .80* TR(33)
C ***** FROM BUYER TO TRAFFIC
C ATT(16)=1
C GOTO 9999

C
C ***** M6 STEP 17 *****
C
C ***** FROM TRAFFIC TO BUYER
C 833 ATT(6)=1
C BUYER SERVICE TIME
C ATT(42)= 1.00* TR(56)
C ***** FROM BUYER TO CLERK
C ATT(12)=1
C CLERK SERVICE TIME
C ATT(44)= .30* TR(3)
C ***** FROM CLERK TO TRAFFIC
C ATT(28)=1
C GOTO 9999

C
C ***** M6 STEP 18 *****
C
C ***** FROM TRAFFIC TO BUYER
C 834 ATT(6)=1
C BUYER SERVICE TIME
C ATT(42)= 1.00* TR(54)
C ***** FROM BUYER TO PCO
C ATT(14)=1
C PCO SERVICE TIME

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C      ATT(43)= .40* TR(56)
C      **** FROM PCO .          TO COMMITTEE
C      ATT(51)=1
C      COMMITTEE      SERVICE TIME
C      ATT(51)= 24.00* TR(35)
C      **** FROM COMMITTEE      TO TRAFFIC
C      ATT(38)=1
C      GOTO 9999
C
C      **** M6 STEP 19 ****
C
C      **** FROM TRAFFIC      TC BUYER
C      835 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 2.00* TR(74)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .80* TR(33)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(23)=1
C      GOTO 9999
C
C      **** M6 STEP 20 ****
C
C      **** FROM TRAFFIC      TC BUYER
C      836 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(51)
C      **** FROM BUYER      TO PCO
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .50* TR(46)
C      **** FROM PCO      TC CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .50* TR(25)
C      **** FROM CLERK      TO CONTRACTOR
C      ATT(27)=1
C      CONTRACTOR      SERVICE TIME
C      ATT(48)= 80.00* TR(54)
C      GOTO 9999
C
C      **** M6 STEP 21 ****
C
C      **** FROM CONTRACTOR      TO BUYER
C      837 ATT( 6)=1
C      BUYER      SERVICE TIME

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C      ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO PCC
C      ATT(14)=1
C      PCO      SERVICE TIME
C      ATT(43)= .30* TR(37)
C      **** FROM PCO      TO CLERK
C      ATT(33)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .20* TR( 4)
C      **** FROM CLERK      TO REPRODUCTION
C      ATT(26)=1
C      REPRODUCTION SERVICE TIME
C      ATT(53)= 16.00* TR(54)
C      GOTO 9999
C
C      **** M6 STEP 22 ****
C
C      **** FROM REPRODUCTION TO CLERK
839 ATT(10)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .30* TR( 3)
C      **** FROM CLERK      TO DISTRIBUTION
C      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
C      ATT(52)= 12.00* TR(35)
C      GOTO 9999
839 GOTO 9999
840 GOTO 9999
841 GOTO 9999
842 GOTO 9999
843 GOTO 9999
844 GOTO 9999
C      END OF M6 NETWORK
C      **** M7 NETWORK ****
845 GOTO(846,847,848,849,850,851,852,853,854,855,856,857,
      *858,859,860,861,862,863,864,865,866,867,868,869,
      *870,871,872,873),STEP
C      **** M7 STEP 1 ****
C      **** FROM TRAFFIC      TO BUYER
846 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 5.00* TR(44)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .90* TR(44)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(29)=1

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C      **** M7 STEP      2 ****
C
C      **** FROM TRAFFIC      TO BUYER
C      847 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)=      .50= TR(46)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)=      .50= TR(45)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999

```

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C      **** M7 STEP      3 ****
C
C      **** FROM TRAFFIC      TO BUYER
C      848 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)=      .50= TR(46)
C      **** FROM BUYER      TO PCC
C      ATT(14)=1
C      PCC      SERVICE TIME
C      ATT(43)=      1.00= TR(26)
C      **** FROM PCC      TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999

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C      ***** M7 STEP      4 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C      849 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(56)
C      ***** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .30* TR(35)
C      ***** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTG 9999

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C          BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C          **** FROM BUYER          TO PCO
ATT(14)=1
C          PCO          SERVICE TIME
ATT(43)= .30* TR(35)
C          **** FROM PCO          TO CONTRACTOR
ATT(35)=1
C          CONTRACTOR    SERVICE TIME
ATT(48)=176.00* TR(34)
GOTO 9999

C
C          **** M7 STEP 6 ****
C
C          **** FROM CONTRACTOR    TO BUYER
851 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(54)
C          **** FROM BUYER          TO TECH.EVAL
ATT(19)=1
C          TECH.EVAL    SERVICE TIME
ATT(50)=104.00* TR(36)
GOTO 9999

C
C          **** M7 STEP 7 ****
C
C          **** FROM TECH.EVAL    TO BUYER
852 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 2.00* TR(55)
C          **** FROM BUYER          TO AUDIT
ATT(20)=1
C          AUDIT          SERVICE TIME
ATT(55)=352.00* TR(54)
GOTO 9999

C
C          **** M7 STEP 8 ****
C
C          **** FROM AUDIT          TO BUYER
853 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 6.00* TR(33)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 1.50* TR(45)
C          **** FROM CLERK          TO PCO
ATT(23)=1

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C          PCO          SERVICE TIME
ATT(43)= 1.00* TR(26)
C          **** FROM PCO          TO TRAFFIC
ATT(35)=1
GOTO 9999

C          **** M7 STEP   5  ****

C          **** FROM TRAFFIC      TO BUYER
854 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TP(56)
C          **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C          **** M7 STEP  10  ****

C          **** FROM TRAFFIC      TO BUYER
855 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 4.00* TP(24)
C          **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C          **** M7 STEP  11  ****

C          **** FROM TRAFFIC      TO BUYER
856 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 5.00* TR(33)
C          **** FROM BUYER      TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 3.00* TR(33)
C          **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C          **** M7 STEP  12  ****

C          **** FROM TRAFFIC      TO BUYER
857 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 2.00* TR(56)
C          **** FROM BUYER      TO CLERK
ATT(12)=1

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C          CLERK          SERVICE TIME
ATT(44)= .50* TR(45)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          **** M7 STEP 13 ****
C
C          **** FROM TRAFFIC          TO BUYER
858 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= .75* TR(33)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCO          SERVICE TIME
ATT(43)= 1.00* TR(26)
C          **** FROM PCC          TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C          **** M7 STEP 14 ****
C
C          **** FROM TRAFFIC          TO BUYER
859 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= .50* TR(49)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= .30* TR(36)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          **** M7 STEP 15 ****
C
C          **** FROM TRAFFIC          TO BUYER
860 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= .50* TR(66)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCO          SERVICE TIME
ATT(43)= .50* TP(46)
C          **** FROM PCC          TO TRAFFIC
ATT(36)=1
GOTO 9999
C

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C      ***** M7 STEP 16 *****
C
C      ***** FROM TRAFFIC          TO BUYER
861 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .80* TR(33)
C      ***** FROM BUYER          TO JAG
ATT(18)=1
C      JAG          SERVICE TIME
ATT(49)= 24.00* TR(55)
GOTO 9999

C
C      ***** M7 STEP 17 *****
C
C      ***** FROM JAG          TO BUYER
862 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .80* TR(33)
C      ***** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      ***** M7 STEP 18 *****
C
C      ***** FROM TRAFFIC          TO BUYER
863 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(56)
C      ***** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .30* TR( 3)
C      ***** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      ***** M7 STEP 19 *****
C
C      ***** FROM TRAFFIC          TO BUYER
864 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(54)
C      ***** FROM BUYER          TO PCO
ATT(14)=1
C      PCO          SERVICE TIME
ATT(43)= .40* TR(55)
C      ***** FROM PCO          TO COMMITTEE
ATT(61)=1

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C          COMMITTEE    SERVICE TIME
ATT(51)= 24.00* TR(35)
C          **** FROM COMMITTEE    TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C          **** M7 STEP  20 ****
C
C          **** FROM TRAFFIC    TO BUYER
865 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 2.00* TR(74)
C          **** FROM BUYER    TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= .80* TR(33)
C          **** FROM CLERK    TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          **** M7 STEP  21 ****
C
C          **** FROM TRAFFIC    TO BUYER
866 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(51)
C          **** FROM BUYER    TO PCO
ATT(14)=1
C          PCO          SERVICE TIME
ATT(43)= .50* TR(46)
C          **** FROM PCO    TO CLERK
ATT(33)=1
C          CLERK          SERVICE TIME
ATT(44)= .50* TR(25)
C          **** FROM CLERK    TO CONTRACTOR
ATT(27)=1
C          CONTRACTOR    SERVICE TIME
ATT(48)= 80.00* TR(54)
GOTO 9999

C
C          **** M7 STEP  22 ****
C
C          **** FROM CONTRACTOR    TO BUYER
867 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(56)
C          **** FROM BUYER    TO PCO
ATT(14)=1

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C      PC0      SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PC0      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** M7 STEP 23 ****
C
C      **** FROM TRAFFIC      TO BUYER
868 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .20* TR( 4)
C      **** FROM CLERK      TO REPRODUCTION
ATT(26)=1
C      REPRODUCTION SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999

C
C      **** M7 STEP 24 ****
C
C      **** FROM REPRODUCTION TO CLERK
869 ATT(10)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR( 3)
C      **** FROM CLERK      TO DISTRIBUTION
ATT(25)=1
C      DISTRIBUTION SERVICE TIME
ATT(52)= 12.00* TR(35)
GOTO 9999
870 GOTO 9999
871 GOTO 9999
872 GOTO 9999
873 GOTO 9999
C      END OF M7 NETWORK
C      **** M8 NETWORK ****
874 GOTO(875,876,877,878,879,880,881,882,883,884,885,886,
      *887,888,889,890,891,892,893,894,895,896,897,898,
      *899,900,901,902,903,904,905,906),STEP
C      **** M8 STEP 1 ****
C      **** FROM TRAFFIC      TO BUYER
875 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 8.00* TR(55)
C      **** FROM BUYER      TO CLERK

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C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .80* TR(33)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** M3 STEP  2 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 876 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO TRAFFIC
C      ATT(16)=1
C      GOTO 9999
C
C      **** M3 STEP  3 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 877 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 2.00* TR(56)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= 1.00* TR(45)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** M3 STEP  4 ****
C
C      **** FROM TRAFFIC      TO BUYER
C 878 ATT( 6)=1
C      BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(38)
C      **** FROM BUYER      TO CLERK
C      ATT(12)=1
C      CLERK      SERVICE TIME
C      ATT(44)= .50* TR(46)
C      **** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      **** M3 STEP  5 ****
C
C      **** FROM TRAFFIC      TO BUYER

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879 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER          TO PCO
ATT(14)=1
C      PCO          SERVICE TIME
ATT(43)= 1.80* TR(33)
C      **** FROM PCO          TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** M3 STEP 6 ****
C
C      **** FROM TRAFFIC          TO BUYER
880 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .30* TR(35)
C      **** FROM CLERK          TO TRAFFIC
ATT(26)=1
GOTO 9999

C
C      **** M8 STEP 7 ****
C
C      **** FROM TRAFFIC          TO BUYER
881 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER          TO PCO
ATT(14)=1
C      PCO          SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PCO          TO COMMITTEE
ATT(61)=1
C      COMMITTEE          SERVICE TIME
ATT(51)= 24.00* TP(45)
C      **** FROM COMMITTEE          TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C      **** M8 STEP 8 ****
C
C      **** FROM TRAFFIC          TO BUYER
882 ATT( 6)=1
C      BUYER          SERVICE TIME

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      ATT(42)= 2.00* TR(57)
C      **** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= .40* TR(54)
C      **** FROM CLERK        TO TRAFFIC
      ATT(28)=1
      GOTO 9999

C
C      **** M8 STEP   9 ****
C
C      **** FROM TRAFFIC      TO BUYER
883 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= .80* TR(55)
C      **** FROM BUYER        TO PCO
      ATT(14)=1
C      PCO          SERVICE TIME
      ATT(43)= .80* TR(35)
C      **** FROM PCO          TO CONTRACTOR
      ATT(35)=1
C      CONTRACTOR    SERVICE TIME
      ATT(48)=176.00* TR(34)
      GOTO 9999

C
C      **** M8 STEP  10 ****
C
C      **** FROM CONTRACTOR    TO BUYER
884 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 1.00* TR(54)
C      **** FROM BUYER        TO TECH.EVAL
      ATT(19)=1
C      TECH.EVAL    SERVICE TIME
      ATT(50)=104.00* TR(36)
      GOTO 9999

C
C      **** M6 STEP  11 ****
C
C      **** FROM TECH.EVAL    TO BUYER
885 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 2.00* TR(55)
C      **** FROM BUYER        TO AUDIT
      ATT(20)=1
C      AUDIT          SERVICE TIME
      ATT(55)=352.00* TR(54)
      GOTO 9999

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C
 C ***** M8 STEP 12 *****
 C
 C ***** FROM AUDIT TO BUYER
 C 886 ATT(6)=1
 C BUYER SERVICE TIME
 C ATT(42)= 5.00* TR(42)
 C ***** FROM BUYER TO CLERK
 C ATT(12)=1
 C CLERK SERVICE TIME
 C ATT(44)= 1.50* TR(45)
 C ***** FROM CLERK TO PCO
 C ATT(23)=1
 C PCO SERVICE TIME
 C ATT(43)= 1.50* TP(33)
 C ***** FROM PCO TO TRAFFIC
 C ATT(36)=1
 C GOTO 9999

C
 C ***** M8 STEP 13 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 C 867 ATT(6)=1
 C BUYER SERVICE TIME
 C ATT(42)= 1.00* TR(56)
 C ***** FROM BUYER TO TRAFFIC
 C ATT(16)=1
 C GOTO 9999

C
 C ***** M8 STEP 14 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 C 888 ATT(6)=1
 C BUYER SERVICE TIME
 C ATT(42)= 8.00* TR(54)
 C ***** FROM BUYER TO TRAFFIC
 C ATT(16)=1
 C GOTO 9999

C
 C ***** M8 STEP 15 *****
 C
 C ***** FROM TRAFFIC TO BUYER
 C 889 ATT(6)=1
 C BUYER SERVICE TIME
 C ATT(42)= 8.00* TR(25)
 C ***** FROM BUYER TO CLERK
 C ATT(12)=1
 C CLERK SERVICE TIME

```

ATT(44)= 3.50* TR(23)
C ***** FROM CLERK TO TRAFFIC
ATT(28)=1
GOTO 9999

C ***** M8 STEP 16 *****
C ***** FROM TRAFFIC TO BUYER
890 ATT( 6)=1
C BUYER SERVICE TIME
ATT(42)= 3.00* TR(53)
C ***** FROM BUYER TO CLERK
ATT(12)=1
C CLERK SERVICE TIME
ATT(44)= .50* TR(45)
C ***** FROM CLERK TO TRAFFIC
ATT(28)=1
GOTO 9999

C ***** M8 STEP 17 *****
C ***** FROM TRAFFIC TO BUYER
891 ATT( 6)=1
C BUYER SERVICE TIME
ATT(42)= .75* TR(33)
C ***** FROM BUYER TO PCO
ATT(14)=1
C PCO SERVICE TIME
ATT(43)= 1.80* TR(43)
C ***** FROM PCO TO TRAFFIC
ATT(36)=1
GOTO 9999

C ***** M8 STEP 18 *****
C ***** FROM TRAFFIC TO BUYER
892 ATT( 6)=1
C BUYER SERVICE TIME
ATT(42)= .50* TR(49)
C ***** FROM BUYER TO CLERK
ATT(12)=1
C CLERK SERVICE TIME
ATT(44)= .30* TR(36)
C ***** FROM CLERK TO TRAFFIC
ATT(28)=1
GOTO 9999

C ***** M8 STEP 19 *****

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C
C      **** FROM TRAFFIC      TO BUYER
893 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(66)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(46)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C      **** M8 STEP 20 ****
C
C      **** FROM TRAFFIC      TO BUYER
894 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(33)
C      **** FROM BUYER      TO JAG
ATT(18)=1
C      JAG      SERVICE TIME
ATT(49)= 24.00* TR(55)
GOTO 9999

C
C      **** M8 STEP 21 ****
C
C      **** FROM JAG      TO BUYER
895 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .80* TR(33)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** M8 STEP 22 ****
C
C      **** FROM TRAFFIC      TO BUYER
896 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR( 3)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

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C
C      ***** M8 STEP 23 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 897 ATT( 6)=1
C          BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(54)
C      ***** FROM BUYER      TO PCO
C      ATT(14)=1
C          PCO      SERVICE TIME
C      ATT(43)= .40* TR(56)
C      ***** FROM PCO      TO COMMITTEE
C      ATT(61)=1
C          COMMITTEE      SERVICE TIME
C      ATT(51)= 24.00* TR(35)
C      ***** FROM COMMITTEE      TO TRAFFIC
C      ATT(38)=1
C      GOTO 9999
C
C      ***** M8 STEP 24 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 898 ATT( 6)=1
C          BUYER      SERVICE TIME
C      ATT(42)= 2.00* TR(74)
C      ***** FROM BUYER      TO CLERK
C      ATT(12)=1
C          CLERK      SERVICE TIME
C      ATT(44)= .80* TR(33)
C      ***** FROM CLERK      TO TRAFFIC
C      ATT(28)=1
C      GOTO 9999
C
C      ***** M9 STEP 25 *****
C
C      ***** FROM TRAFFIC      TO BUYER
C 899 ATT( 6)=1
C          BUYER      SERVICE TIME
C      ATT(42)= 1.00* TR(51)
C      ***** FROM BUYER      TO PCO
C      ATT(14)=1
C          PCO      SERVICE TIME
C      ATT(43)= .50* TR(46)
C      ***** FROM PCO      TO TRAFFIC
C      ATT(36)=1
C      GOTO 9999
C
C      ***** M8 STEP 26 *****

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C
C      **** FROM TRAFFIC      TO BUYER
900 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .80* TR(33)
C      **** FROM BUYER      TO COMMITTEE
ATT(15)=1
C      COMMITTEE      SERVICE TIME
ATT(51)= 24.00* TR(36)
C      **** FROM COMMITTEE      TO TRAFFIC
ATT(38)=1
GOTO 9999

C
C      **** M8 STEP 27 ****
C
C      **** FROM TRAFFIC      TO BUYER
901 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .80* TR(33)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** M8 STEP 28 ****
C
C      **** FROM TRAFFIC      TO BUYER
902 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .60* TR(14)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** M8 STEP 29 ****
C
C      **** FROM TRAFFIC      TO BUYER
903 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO FCC
ATT(14)=1
C      FCC      SERVICE TIME
ATT(43)= 1.00* TR(54)
C      **** FROM FCC      TO CLERK

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ATT(33)=1
C      CLERK      SERVICE TIME
ATT(44)= .50* TR(25)
C      **** FROM CLERK      TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR  SERVICE TIME
ATT(48)= 80.00* TR(54)
GOTO 9999
C
C      **** M8 STEP 30 ****
C
C      **** FROM CONTRACTOR  TO BUYER
904 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 2.00* TR(54)
C      **** FROM BUYER      TO PCC
ATT(14)=1
C      PCO        SERVICE TIME
ATT(43)= .80* TR(33)
C      **** FROM PCC        TO TRAFFIC
ATT(36)=1
GOTO 9999
C
C      **** M8 STEP 31 ****
C
C      **** FROM TRAFFIC    TO BUYER
905 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .20* TR( 4)
C      **** FROM CLERK      TO REPRODUCTION
ATT(25)=1
C      REPRDUCTION SERVICE TIME
ATT(53)= 16.00* TR(54)
GOTO 9999
C
C      **** M8 STEP 32 ****
C
C      **** FROM REPRODUCTION TO CLERK
906 ATT(10)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR( 3)
C      **** FROM CLERK      TO DISTRIBUTION
ATT(25)=1
C      DISTIRBUTION SERVICE TIME

```

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ATT(52)= 12.00* TR(35)
GOTO 9999
C  END-OF MR NETWORK
C  **** F4 NETWORK ****
907 GOTO(908,909,910,911,912,913,914,915,916,917,918,919,
    *920,921,922,923,924,925,926,927,928,929,930,931,
    *932,933,934,935),STEP
C  **** F4 STEP 1 ****
C  **** FROM TRAFFIC TO BUYER
908 ATT( 6)=1
C  BUYER SERVICE TIME
ATT(42)= 3.30* TR(33)
C  **** FROM BUYER TO CLERK
ATT(12)=1
C  CLERK SERVICE TIME
ATT(44)= .50* TR(25)
C  **** FROM CLERK TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C  **** F4 STEP 2 ****
C
C  **** FROM TRAFFIC TO BUYER
909 ATT( 6)=1
C  BUYER SERVICE TIME
ATT(42)= .80* TR(33)
C  **** FROM BUYER TO CLERK
ATT(12)=1
C  CLERK SERVICE TIME
ATT(44)= .50* TR(46)
C  **** FROM CLERK TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C  **** F4 STEP 3 ****
C
C  **** FROM TRAFFIC TO BUYER
910 ATT( 6)=1
C  BUYER SERVICE TIME
ATT(42)= .50* TR(46)
C  **** FROM BUYER TO PCC
ATT(14)=1
C  PCC SERVICE TIME
ATT(43)= .50* TR(45)
C  **** FROM PCC TO TRAFFIC
ATT(36)=1
GOTO 9999
C

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```

C      ***** F4 STEP   4 *****
C
C      ***** FROM TRAFFIC      TO BUYER
911 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      ***** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR(35)
C      ***** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      ***** F4 STEP   5 *****
C
C      ***** FROM TRAFFIC      TO BUYER
912 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      ***** FROM BUYER      TO PCC
ATT(14)=1
C      PCC      SERVICE TIME
ATT(43)= .30* TR(37)
C      ***** FROM PCC      TO CONTRACTOR
ATT(35)=1
C      CONTRACTOR      SERVICE TIME
ATT(48)=144.00* TR(43)
GOTO 9999

C
C      ***** F4 STEP   6 *****
C
C      ***** FROM CONTRACTOR      TO BUYER
913 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      ***** FROM BUYER      TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL      SERVICE TIME
ATT(55)= 30.00* TR( 6)
GOTO 9999

C
C      ***** F4 STEP   7 *****
C
C      ***** FROM TECH.EVAL      TO BUYER
914 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.30* TR(56)

```

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C      ***** FROM BUYER          TO TRAFFIC
      ATT(16)=1
      GOTO 9999
C
C      ***** F4 STEP    8 *****
C
C      ***** FROM TRAFFIC        TO BUYER
915 ATT( 6)=1
      BUYER          SERVICE TIME
      ATT(42)= 3.00* TR(54)
C      ***** FROM BUYER          TO PCO
      ATT(14)=1
C      PCO          SERVICE TIME
      ATT(43)= .50* TR(45)
C      ***** FROM PCO          TO TRAFFIC
      ATT(36)=1
      GOTO 9999
C
C      ***** F4 STEP    9 *****
C
C      ***** FROM TRAFFIC        TO BUYER
916 ATT( 6)=1
      BUYER          SERVICE TIME
      ATT(42)= 1.50* TR(46)
C      ***** FROM BUYER          TO TRAFFIC
      ATT(16)=1
      GOTO 9999
C
C      ***** F4 STEP   10 *****
C
C      ***** FROM TRAFFIC        TO BUYER
917 ATT( 6)=1
      BUYER          SERVICE TIME
      ATT(42)= 2.30* TR(44)
C      ***** FROM BUYER          TO CLERK
      ATT(12)=1
C      CLERK          SERVICE TIME
      ATT(44)= 2.00* TR(24)
C      ***** FROM CLERK          TO TRAFFIC
      ATT(26)=1
      GOTO 9999
C
C      ***** F4 STEP   11 *****
C
C      ***** FROM TRAFFIC        TO BUYER
918 ATT( 6)=1
      BUYER          SERVICE TIME
      ATT(42)= .80* TR(55)

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```

C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .50* TR(45)
C      **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      **** F4 STEP 12 ****
C

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```

C      **** FROM TRAFFIC        TO BUYER
919 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .75* TR(33)
C      **** FROM BUYER          TO PCO
ATT(14)=1
C      PCO          SERVICE TIME
ATT(43)= 1.00* TR(53)
C      **** FROM PCO          TO TRAFFIC
ATT(36)=1
GOTO 9999

```

```

C
C      **** F4 STEP 13 ****
C

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C      **** FROM TRAFFIC        TO BUYER
920 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .50* TR(49)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .30* TR(36)
C      **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

```

```

C
C      **** F4 STEP 14 ****
C

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```

C      **** FROM TRAFFIC        TO BUYER
921 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .50* TR(66)
C      **** FROM BUYER          TO PCO
ATT(14)=1
C      PCO          SERVICE TIME
ATT(43)= .30* TR( 5)
C      **** FROM PCO          TO TRAFFIC
ATT(36)=1

```



```

GOTO 9999
C
C      **** F4 STEP 15 ****
C
C      **** FROM TRAFFIC      TO BUYER
922 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(33)
C      **** FROM BUYER      TO JAG
ATT(18)=1
C      JAG      SERVICE TIME
ATT(49)= 16.00* TR(56)
GOTO 9999
C
C      **** F4 STEP 16 ****
C
C      **** FROM JAG      TO BUYER
923 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(33)
C      **** FROM BUYER      TO TRAFFIC
ATT(16)=1
GOTO 9999
C
C      **** F4 STEP 17 ****
C
C      **** FROM TRAFFIC      TO BUYER
924 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR( 3)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999
C
C      **** F4 STEP 18 ****
C
C      **** FROM TRAFFIC      TO BUYER
925 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .30* TR( 5)

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```

C      **** FROM PCC          TO CLERK
      ATT(33)=1
C      CLERK          SERVICE TIME
      ATT(44)= .50* TR(25)
C      **** FROM CLERK        TO CONTRACTOR
      ATT(27)=1
C      CONTRACTOR    SERVICE TIME
      ATT(48)= 90.00* TR(54)
      GOTO 9999
C
C      **** F4 STEP 19 ****
C
C      **** FROM CONTRACTOR    TO BUYER
926 ATT( 6)=1
C      BUYER          SERVICE TIME
      ATT(42)= 1.00* TR(54)
C      **** FROM BUYER        TO PCC
      ATT(14)=1
C      PCC            SERVICE TIME
      ATT(43)= .30* TR(35)
C      **** FROM PCC          TO CLERK
      ATT(33)=1
C      CLERK          SERVICE TIME
      ATT(44)= .20* TR( 4)
C      **** FROM CLERK        TO REPRODUCTION
      ATT(26)=1
C      REPRODUCTION SERVICE TIME
      ATT(53)= 18.00* TR(54)
      GOTO 9999
C
C      **** F4 STEP 20 ****
C
C      **** FROM REPRODUCTION TO CLERK
927 ATT(10)=1
C      CLERK          SERVICE TIME
      ATT(44)= .30* TR( 3)
C      **** FROM CLERK        TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTO 9999
928 GOTO 9999
929 GOTO 9999
930 GOTO 9999
931 GOTO 9999
932 GOTO 9999
933 GOTO 9999
934 GOTO 9999

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```

935 GOTO 9999
C     END OF F4 NETWORK
C     ***** A1 NETWORK *****
936 GOTO(937,938),STEP
C     ***** A1 STEP 1 *****
C     ***** FROM TRAFFIC          TO BUYER
937 ATT(6)=1
C     BUYER          SERVICE TIME
ATT(42)= 1.00* TR(57)
C     ***** FROM BUYER          TO CLERK
ATT(12)=1
C     CLERK          SERVICE TIME
ATT(44)= .60* TR(33)
C     ***** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C     ***** A1 STEP 2 *****
C
C     ***** FROM TRAFFIC          TO BUYER
938 ATT(6)=1
C     BUYER          SERVICE TIME
ATT(42)= .30* TR(28)
C     ***** FROM BUYER          TO PCO
ATT(14)=1
C     PCO          SERVICE TIME
ATT(43)= .30* TR(1)
C     ***** FROM PCO          TO CLERK
ATT(33)=1
C     CLERK          SERVICE TIME
ATT(44)= .30* TR(3)
C     ***** FROM CLERK          TO DISTRIBUTION
ATT(25)=1
C     DISTRIBUTION SERVICE TIME
ATT(52)= 12.00* TR(35)
GOTO 9999

C     END OF A1 NETWORK
C     ***** F3 NETWORK *****
939 GOTO(940,941,942,943,944,945,946,947,948,949,950,951,
*952,953,954,955,956,957,958,959,960,961,962,963,
*964,965,966,967),STEP
C     ***** F3 STEP 1 *****
C     ***** FROM TRAFFIC          TO PCO
940 ATT(56)=1
C     PCO          SERVICE TIME
ATT(43)= .50* TR(46)
C     ***** FROM PCO          TO BUYER
ATT(29)=1

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C          BUYER          SERVICE TIME
ATT(42)= 5.00* TR(36)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 4.00* TR(23)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          **** F3 STEP 2 ****
C
C          **** FROM TRAFFIC          TO BUYER
941 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(56)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= .50* TR( 1)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          **** F3 STEP 3 ****
C
C          **** FROM TRAFFIC          TO BUYER
942 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= .50* TR(46)
C          **** FROM BUYER          TO PCC
ATT(14)=1
C          PCC          SERVICE TIME
ATT(43)= 1.00* TR(44)
C          **** FROM PCC          TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C          **** F3 STEP 4 ****
C
C          **** FROM TRAFFIC          TO BUYER
943 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(56)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 1.00* TR(51)

```

C ***** FROM CLERK TO TRAFFIC
 ATT(28)=1
 GOTO 9999

C
 C ***** F3 STEP 5 *****

C ***** FROM TRAFFIC TO BUYER
 944 ATT(6)=1
 C BUYER SERVICE TIME
 ATT(42)= .50* TR(46)
 C ***** FROM BUYER TO PCO
 ATT(14)=1
 C PCO SERVICE TIME
 ATT(43)= .30* TR(6)
 C ***** FROM PCO TO CLERK
 ATT(33)=1
 C CLERK SERVICE TIME
 ATT(44)= 1.50* TR(44)
 C ***** FROM CLERK TO TRAFFIC
 ATT(28)=1
 GOTO 9999

C
 C ***** F3 STEP 6 *****

C ***** FROM TRAFFIC TO BUYER
 945 ATT(6)=1
 C BUYER SERVICE TIME
 ATT(42)= 1.00* TR(54)
 C ***** FROM BUYER TO TECH.EVAL
 ATT(19)=1
 C TECH.EVAL SERVICE TIME
 ATT(50)=100.00* TR(34)
 GOTO 9999

C
 C ***** F3 STEP 7 *****

C ***** FROM TECH.EVAL TO BUYER
 946 ATT(6)=1
 C BUYER SERVICE TIME
 ATT(42)= 2.00* TR(54)
 C ***** FROM BUYER TO TRAFFIC
 ATT(16)=1
 GOTO 9999

C
 C ***** F3 STEP 8 *****

C ***** FROM TRAFFIC TO BUYER
 947 ATT(6)=1

```

C          BUYER          SERVICE TIME
ATT(42)= 4.00* TR(24)
C          **** FROM BUYER          TO PCO
ATT(14)=1
C          PCO          SERVICE TIME
ATT(43)= .50* TR(46)
C          **** FROM PCO          TO TRAFFIC
ATT(36)=1
GOTO 9999

C
C          **** F3 STEP 9 ****
C
C          **** FROM TRAFFIC          TO BUYER
948 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 2.00* TR(54)
C          **** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C          **** F3 STEP 10 ****
C
C          **** FROM TRAFFIC          TO BUYER
949 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 6.00* TR(51)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= 3.00* TR(33)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C          **** F3 STEP 11 ****
C
C          **** FROM TRAFFIC          TO BUYER
950 ATT( 6)=1
C          BUYER          SERVICE TIME
ATT(42)= 1.00* TR(54)
C          **** FROM BUYER          TO CLERK
ATT(12)=1
C          CLERK          SERVICE TIME
ATT(44)= .80* TR(33)
C          **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C

```

```

C      **** F3 STEP 12 ****
C
C      **** FROM TRAFFIC      TO BUYER
951 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .80* TR(33)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= 1.00* TR(24)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9599

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```

C      **** F3 STEP 13 ****
C
C      **** FROM TRAFFIC      TO BUYER
952 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(49)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= 1.00* TR(43)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9399

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```

C      **** F3 STEP 14 ****
C
C      **** FROM TRAFFIC      TO BUYER
953 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .30* TR( 7)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(45)
C      **** FROM PCO      TO TRAFFIC
ATT(36)=1
GOTO 9999

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```

C      **** F3 STEP 15 ****
C
C      **** FROM TRAFFIC      TO BUYER
954 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .90* TR( 6)

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```

C      **** FROM BUYER          TO JAG
ATT(18)=1
C      JAG          SERVICE TIME
ATT(49)= 16.00* TR(55)
GOTO 9999

C
C      **** F3 STEP 16 ****
C
C      **** FROM JAG          TO BUYER
955 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= .80* TR( 6)
C      **** FROM BUYER          TO TRAFFIC
ATT(16)=1
GOTO 9999

C
C      **** F3 STEP 17 ****
C
C      **** FROM TRAFFIC          TO BUYER
956 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.50* TR(56)
C      **** FROM BUYER          TO CLERK
ATT(12)=1
C      CLERK          SERVICE TIME
ATT(44)= .80* TR(33)
C      **** FROM CLERK          TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** F3 STEP 18 ****
C
C      **** FROM TRAFFIC          TO BUYER
957 ATT( 6)=1
C      BUYER          SERVICE TIME
ATT(42)= 1.00* TR(54)
C      **** FROM BUYER          TO PCO
ATT(14)=1
C      PCO          SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PCO          TO CLERK
ATT(33)=1
C      CLERK          SERVICE TIME
ATT(44)= 1.00* TR(13)
C      **** FROM CLERK          TO CONTRACTOR
ATT(27)=1
C      CONTRACTOR          SERVICE TIME
ATT(48)= 54.00* TR(44)

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      GOTO 9999
C
C      **** F3 STEP 15 ****
C
C      **** FROM CONTRACTOR TO BUYER
958 ATT(6)=1
C      BUYER SERVICE TIME
ATT(42)= .80* TR(33)
C      **** FROM BUYER TO PCO
ATT(14)=1
C      PCO SERVICE TIME
ATT(43)= .30* TR(35)
C      **** FROM PCO TO CLERK
ATT(33)=1
C      CLERK SERVICE TIME
ATT(44)= .30* TR(5)
C      **** FROM CLERK TO REPRODUCTION
ATT(26)=1
C      REPRODUCTION SERVICE TIME
ATT(53)= 16.00* TR(54)
      GOTO 9999
C
C      **** F3 STEP 20 ****
C
C      **** FROM REPRODUCTION TO CLERK
959 ATT(10)=1
C      CLERK SERVICE TIME
ATT(44)= 1.00* TR(4)
C      **** FROM CLERK TO DISTRIBUTION
ATT(25)=1
C      DISTRIBUTION SERVICE TIME
ATT(52)= 12.00* TR(35)
      GOTO 9999
960 GOTO 9999
961 GOTO 9999
962 GOTO 9999
963 GOTO 9999
964 GOTO 9999
965 GOTO 9999
966 GOTO 9999
967 GOTO 9999
C      END OF F3 NETWORK
C      **** MD NETWORK ****
968 GOTO(969,970,971,972,973,974,975,976,977,978,979,980,
+981,982,983,984,985,986,987,988,989,990,991,992,
+993,994,995,996),STEP
C      **** MU STEP 1 ****
C      **** FROM TRAFFIC TO BUYER

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969 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 1.00* TR(56)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .30* TR(51)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** NO STEP 2 ****
C
C      **** FROM TRAFFIC      TO BUYER
970 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .30* TR(55)
C      **** FROM BUYER      TO TECH.EVAL
ATT(19)=1
C      TECH.EVAL      SERVICE TIME
ATT(50)= 48.00* TR(46)
GOTO 9999

C
C      **** NO STEP 3 ****
C
C      **** FROM TECH.EVAL      TO BUYER
971 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= 3.00* TR(35)
C      **** FROM BUYER      TO CLERK
ATT(12)=1
C      CLERK      SERVICE TIME
ATT(44)= .80* TR(33)
C      **** FROM CLERK      TO TRAFFIC
ATT(28)=1
GOTO 9999

C
C      **** NO STEP 4 ****
C
C      **** FROM TRAFFIC      TO BUYER
972 ATT( 6)=1
C      BUYER      SERVICE TIME
ATT(42)= .50* TR(46)
C      **** FROM BUYER      TO PCO
ATT(14)=1
C      PCO      SERVICE TIME
ATT(43)= .50* TR(46)
C      **** FROM PCO      TO CONTRACTOR

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      ATT(35)=1
C      CONTRACTOR    SERVICE TIME
      ATT(43)= 80.00* TR(54)
      GOTO 9999

C
C      ***** NO STEP    5 *****
C
C      ***** FROM CONTRACTOR    TO BUYER
973 ATT(6)=1
C      BUYER          SERVICE TIME
      ATT(42)= .50* TR(46)
C      ***** FROM BUYER          TO PCO
      ATT(14)=1
C      PCO            SERVICE TIME
      ATT(43)= .30* TR(61)
C      ***** FROM PCO            TO CLERK
      ATT(33)=1
C      CLERK          SERVICE TIME
      ATT(44)= .30* TR(31)
C      ***** FROM CLERK          TO REPRODUCTION
      ATT(26)=1
C      REPRODUCTION SERVICE TIME
      ATT(53)= 16.00* TR(54)
      GOTO 9999

C
C      ***** NO STEP    6 *****
C
C      ***** FROM REPRODUCTION TO CLERK
974 ATT(10)=1
C      CLERK          SERVICE TIME
      ATT(44)= .20* TR(51)
C      ***** FROM CLERK          TO DISTRIBUTION
      ATT(25)=1
C      DISTRIBUTION SERVICE TIME
      ATT(52)= 12.00* TR(35)
      GOTO 9999
975 GOTO 9999
976 GOTO 9999
977 GOTO 9999
978 GOTO 9999
979 GOTO 9999
980 GOTO 9999
981 GOTO 9999
982 GOTO 9999
983 GOTO 9999
984 GOTO 9999
985 GOTO 9999
986 GOTO 9999

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987 GOTO 9999
988 GOTO 9999
989 GOTO 9999
990 GOTO 9999
991 GOTO 9999
992 GOTO 9999
993 GOTO 9999
994 GOTO 9999
995 GOTO 9999
996 GOTO 9999
C      END OF MC NETWORK
C
C *****
C      TABULATE RESULTS OF EACH SINK
3000 XXXX = TMAK(IDUM)
      IF(TNOW.GT.START) THEN
      X = TNOW-XXXX
      DO 1088 K = 1,26
C          *** TOTALS FOR THIS RUN ***
      IF (ATT(2).EQ.K) THEN
      TOTX(K) = TOTX(K) + X
      ITTN(K) = ITTN(K) + 1
      SUMSQ(K) = SUMSQ(K) + X**2
C          *** TOTALS FOR ALL RUNS ***
      CTOTX(K) = CTOTX(K) + X
      NTOT(K) = NTOT(K) + 1
      CSSQ(K) = CSSQ(K) + X**2
      ENDIF
1088 CONTINUE
      ENDIF
      UF = 3
      RETURN
C
C ***** RETURN *****
9999 ATT(1) = STEP + 1.
C
C
C      TOTAL WORK TIME IS AUGMENTED WITH NON-PRODUCTIVE TIME
C      COMPOSED OF NON-DATAEN WORK, IDLENESS, AND LEAVE.
      ATT(42) = ATT(42) + 2.09
      ATT(43) = ATT(43) + 2.32
      ATT(44) = ATT(44) + 2.06
C
      ATT(62) = ATT(44) + BURDB
      ATT(63) = ATT(44) + BURDA
C      BUYER B
C
      IF(ATT(4).EQ.2) THEN

```

```

ATT(7) = ATT(6)
ATT(5) = 0
ATT(22) = ATT(21)
ATT(21) = 0
ATT(30) = ATT(29)
ATT(29) = 0
ATT(46) = ATT(45)
ATT(45) = 0
END IF

```

C
C
C

BUYER C

```

IF(ATT(4).EQ.3) THEN
  ATT(8) = ATT(6)
  ATT(6) = 0
  ATT(56) = ATT(21)
  ATT(21) = 0
  ATT(31) = ATT(29)
  ATT(29) = 0
  ATT(47) = ATT(45)
  ATT(45) = 0
ENDIF

```

C
C
C

BUYER D

```

IF(ATT(4).EQ.4) THEN
  ATT(9) = ATT(6)
  ATT(5) = 0
  ATT(57) = ATT(21)
  ATT(21) = 0
  ATT(32) = ATT(29)
  ATT(29) = 0
  ATT(59) = ATT(45)
  ATT(45) = 0
ENDIF

```

C
C
C

WITHOUT THE NEXT FEW LINES ALL WORK WOULD GO TO CLERK-A.

```

IF(ATT(4).GE.PATIC) THEN
  ATT(11) = ATT(10)
  ATT(10) = 0
  ATT(13) = ATT(12)
  ATT(12) = 0
  ATT(34) = ATT(33)
  ATT(33) = 0
  ATT(41) = ATT(40)
  ATT(40) = 0
ENDIF

```



```

WRITE(6,*) * *
WRITE(6,100) NRUN
WRITE(6,102)
DO 19 K = 1,28
IF(ITTN(K).GT.0) THEN
AVEX = TOTX(K) / ITTN(K)
IF(ITTN(K).GT.1) THEN
STDEVSQ=SQRT((SUMSQ(K)-((TOTX(K)**2)/ITTN(K)))/(ITTN(K)-1))
ELSE
STDEVSQ = 0
ENDIF
ELSE
AVEX = 0
STDEVSQ = 0
ENDIF
WRITE(6,104) LIST(K),ITTN(K),AVEX,STDEVSQ
100 FORMAT(6X,'P U N   N U M B E R   ',I3)
102 FORMAT(6X,'NETWORK',3X,'COMPLETIONS',3X,'AVE TIME',3X,
1'STD DEVIATION')
104 FORMAT(10X,A2,7X,I3,7X,F7.1,6X,F7.1)
19 CONTINUE
IF(NRUNS.EQ.NRUN) THEN
C***** PRINT OUT AFTER ALL RUNS *****
WRITE(6,110)
WRITE(6,112)
DO 2998 K = 1,28
IF(NTOT(K).GT.0) THEN
AVEX = CTOTX(K) / NTOT(K)
IF(NTOT(K).GT.1) THEN
STDEVSQ=SQRT((CSSQ(K)-((CTOTX(K)**2)/NTOT(K)))/(NTOT(K)-1))
IF(NTOT(K).GE.30) THEN
CILP = AVEX - (1.645 * STDEVSQ)
CIHP = AVEX + (1.645 * STDEVSQ)
X = REAL(NTOT(K))
CILM = AVEX - (1.645 * (STDEVSQ/SQRT(X)))
CIHM = AVEX + (1.645 * (STDEVSQ/SQRT(X)))
ELSE
CILP = 0
CIHP = 0
CILM = 0
CIHM = 0
ENDIF
ELSE
STDEVSQ = 0
CILM = 0
CIHM = 0
CILP = 0

```

```

      CIHP = 0
      ENDIF
      WRITE(5,114) LIST(K),NTOT(K),AVEX,STDEV,CILM,CIHP,
1CILF,CIHP
      ENDIF
110 FORMAT(1X,///,1X,"GRAND TOTAL FOR ALL FUNS")
112 FORMAT(4X,"NETWORK",3X,"COMPLETIONS",3X,"AVE TIME",
13X,"STD DEV",3X,"90% CI-MEAN",3X,"90% CI-PREDICTION")
114 FORMAT(7X,A2,9X,I4,9X,F7.1,3X,F7.1,4X,F7.1,1X,"-",1X,
1F7.1,1X,F7.1,1X,"-",1X,F7.1)
9995 CONTINUE
      ENDIF
      RETURN
      END

```


APPENDIX D
Q-GERT PROCEDURES (QGPROC)

CDM,T200,I0200,CM300000. T830259,CHPIS
ATTACH,PROCFIL,ID=A610171,SN=ASDAD.
BEGIN,NCSFILE.
ATTACH,PROCFIL,GGERTPECC,ID=AFIT.
GET,SUB,ID=MILLER.
GET,STAGE,ID=MILLER.
FTNS(I=SUB,LO=0,ANSI=0)
BEGIN,GGERT,,I=STAGE,L=DP OUT1,M=LSD,VER=5,MODE=X.
REPLACE,DP OUT1,ID=MILLER.
ROUTE,DP OUT1,TID=AF,DC=PF,FID=CDM,ST=CSA.

APPENDIX E

INTERVIEW

INTERVIEW

I am gathering data for a thesis which I am doing for AFIT. The purpose of my thesis is to develop a model of R&D Contracting. A model which will imitate the time it takes to award a contract. For example, if it takes your branch an average of 45 days to process a funding action, I want my model to come up with 45 days, also.

In order to get my model to do this, I need accurate estimates of the time to complete each step of the contracting process. This is where you come in. I would like you to provide me with your best estimate of the time it takes you to complete each step of the contracting process.

The questionnaire is very lengthy, and will take some time to fill out. Please think carefully about each step. Because only twelve experts are filling out this questionnaire, your estimates will have a large influence on the group average. Be as precise as you can. If one of your estimates is 10 minutes, don't round it to 'one-half hour', write it as '10 minutes'. Of course for long time periods (such as the RFP solicitation time), being precise may be specifying 35 days, rather than rounding it to one month. If any step is ambiguous, mark it, and ask me about it. I will try to check with you several times during the day.

Your estimates and answers to my questions will be kept anonymous and confidential.

If you find any step or anything in the step which you do not usually do, or if an important item has been left out, please let me know.

I would like you to make three estimates for each contract step. The first estimate is for the normal, or average, time to complete the step. The second estimate is for the optimistic, or short time that the step can be performed if there are few problems, and most things go smoothly. The third estimate is the pessimistic time, the long time that this step would take if there are many problems on this buy. Your estimates should be based on the time that you start working on that step to when you finish the step. Assume that you have nothing else to do and there are no interruptions.

On some of the steps, three extra estimates must be made: (1) the percentage of time the normal situation occurs, (2) the percentage of time the second situation occurs, and (3) the percentage of time the third situation occurs.

No one expects anyone to work 8 hours without taking breaks and socializing. Not counting your lunch time, what percentage of your day do you think you spend not working?

Thank you for your cooperation in this study.

APPENDIX F
CLERK QUESTIONNAIRE

C2 COMPETITIVE BUY \$ 10,000 to \$100,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP

DD254 corrections

Acquisition Plan

Source List (FI 5)

TPP (FI 8)

Contract Type D&F (FI 9)

Set-up RFP File

to buyer

STEP 2: Make RFP Corrections (Buyer)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO)

to buyer, PCO

STEP 4: RFP to Repro

Prepare document for Repro

Type DD 843 (Repro form)

to Repro

STEP 5: Mail RFP

Check Reproduction

Type envelopes

Date stamp RFP

Put RFP in Mail

to offerors, buyer, Lab, buyer

STEP 6: Type Technically Unacceptable Letters and/or
single source justification (if required)

to Buyer

STEP 7: Type BAFO Request Letters

to Buyer who writes contract award

STEP 8: Type Contract Award

Type Contract

Type ROCA

Type DD350

Type FI 39 - Patent Rights

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 9: Make corrections to contract (buyer)

to Buyer, PCO

STEP 10: Make corrections to contract (PCO)

to Buyer, PCO

STEP 11: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 12: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 13: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

Type Sorry Letters

Type Form Letters 12, 13, 87 for PCO signature

Send proposals to Staging

C3 COMPETITIVE BUY \$ 100,000 to \$ 250,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP

DD254 corrections

Acquisition Plan

Source List (FI 5)

TPP (FI 8)

Contract Type D&F (FI 9)

Set-up RFP File

to buyer

STEP 2: Make RFP Corrections (Buyer)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO)

to buyer, PCO

STEP 4: RFP to Repro

Prepare document for Repro

Type DD 843 (Repro form)

to Repro

STEP 5: Mail RFP

Check Reproduction

Type envelopes

Date stamp RFP

Put RFP in Mail

to offerors, buyer, Lab, buyer

STEP 6: Type Technically Unacceptable Letters and/or
single source justification (if required)

to Buyer

STEP 7: Type BAFO Request Letters

to Buyer who writes contract award

STEP 8: Type Contract Award

Type Contract

Type ROCA

Type DD350

Type FI 39 - Patent Rights

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 9: Make corrections to contract (buver's)

to Buyer, PCO

STEP 10: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 11: Make corrections to contract (JAG's)

STEP 12: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 13: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 14: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)
attach BV2 validation, CR01, DD350, contract, ROCA

Type Sorry Letters

Type Form Letters 12, 13, 87 for PCO signature

Send proposals to Staging

C4 COMPETITIVE BUY \$ 250,000 to \$ 500,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP
DD254 corrections
Acquisition Plan
Source List (FI 5)
TPP (FI 8)
Contract Type D&F (FI 9)

Set-up RFP File

to buyer

STEP 2: Make RFP Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO's)

to buyer, PCO, JAG

STEP 4: Make RFP Corrections (JAG's)

to buyer, PCO

STEP 5: RFP to Repro

Prepare document for Repro
Type DD 843 (Repro form)

to Repro

STEP 6: Mail RFP

Check Reproduction

Type envelopes

Date stamp RFP

Put RFP in Mail

to offerors, buyer, Lab, buyer

STEP 7: Type Technically Unacceptable Letters and/or
single source justification (if required)

to Buyer

STEP 8: Type BAFO Request Letters

to Buyer who writes contract award

STEP 9: Type Contract Award

Type Contract

Type ROCA

Type DD350

Type FI 39 - Patent Rights

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 10: Make corrections to contract (buyer's)

to Buyer, PCO

STEP 11: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 12: Make corrections to contract (JAG's)

STEP 13: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 14: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 15: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

Type Sorry Letters

Type Form Letters 12, 13, 87 for PCO signature

Send proposals to Staging

C5 COMPETITIVE BUY \$ 500,000 to \$ 750,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP
DD254 corrections
Acquisition Plan
Source List (FI 5)
TPP (FI 8)
Contract Type D&F (FI 9)

Set-up RFP File

to buyer

STEP 2: Make RFP Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO's)

to buyer, PCO, JAG

STEP 4: Make RFP Corrections (JAG's)

to buyer, PCO

STEP 5: Make RFP Corrections (PMRC's)

to buyer, PCO

STEP 6: RFP to Repro

Prepare document for Repro
Type DD 843 (Repro form)

to Repro

STEP 7: Mail RFP

Check Reproduction
Type envelopes, date stamp RFP
Put RFP in Mail

to offerors, request RFP Amendment

STEP 8: Type RFP Amendment and envelopes, mail

to offerors, buyer, Lab, buyer

STEP 9: Type Technically Unacceptable Letters and/or
single source justification (if required)

to Buyer

STEP 10: Type BAFO Request Letters

to Buyer who writes contract award

STEP 11: Type Contract Award

Type Contract
Type ROCA
Type DD350
Type DD1499

Type FI 39 - Patent Rights

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 12: Make corrections to contract (buyer's)
and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 13: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 14: Make corrections to contract (JAG's)

STEP 15: Make corrections to contract (PMRC's)

STEP 16: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 17: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 18: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)
attach BV2 validation, CR01, DD350, contract, ROCA

Type Sorry Letters

Type Form Letters 12, 13, 87 for PCO signature

Send proposals to Staging

C6 COMPETITIVE BUY \$ 750,000 to \$ 1,000,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP
DD254 corrections
Acquisition Plan
Source List (FI 5)
TPP (FI 8)
Contract Type D&F (FI 9)

Set-up RFP File

to buyer

STEP 2: Make RFP Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO's)

to buyer, PCO, JAG

STEP 4: Make RFP Corrections (JAG's)

to buyer, PCO

STEP 5: Make RFP Corrections (PMRC's)

to buyer, PCO

STEP 6: RFP to Repro

Prepare document for Repro
Type DD 843 (Repro form)

to Repro

STEP 7: Mail RFP

Check Reproduction
Type envelopes
Date stamp RFP
Put RFP in Mail

to offerors, request RFP Amendment

STEP 8: Type RFP Amendment and envelopes, mail

to offerors, buyer, Lab, buyer

STEP 9: Type Technically Unacceptable Letters and/or
single source justification (if required)

to Buyer

STEP 10: Type BAFO Request Letters

to Buyer who writes contract award

STEP 11: Type Contract Award

Type Contract
Type ROCA
Type DD350, DD1499, JAG sheet, Committee sheet

Type FI 39 - Patent Rights

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 12: Make corrections to contract (buyer's)
and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 13: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 14: Make corrections to contract (JAG's)

STEP 15: Make corrections to contract (PMRC's)

STEP 16: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 17: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 18: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

Type Sorry Letters

Type Form Letters 12, 13, 87 for PCO signature

Send proposals to Staging

C7 COMPETITIVE BUY \$ 1,000,000 to \$ 3,500,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP
DD254 corrections
Acquisition Plan
Source List (FI 5)
TPP (FI 8)
Contract Type D&F (FI 9)
FI 59 - JAG review sheet
FI 66 - Committee review sheet

Set-up RFP File

to buyer

STEP 2: Make RFP Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO's)

to buyer, PCO. JAG

STEP 4: Make RFP Corrections (JAG's)

to buyer, PCO

STEP 5: Make RFP Corrections (PMRC's)

to buyer, PCO

STEP 6: RFP to Repro

Prepare document for Repro
Type DD 843 (Repro form)

to Repro

STEP 7: Mail RFP

Check Reproduction
Type envelopes
Date stamp RFP
Put RFP in Mail

to offerors, request RFP Amendment

STEP 8: Type RFP Amendment and envelopes, mail

to offerors, buyer, Lab, buyer

STEP 9: Type Technically Unacceptable Letters and/or
single source justification (if required)

and type pre-negotiation presentation documents

to Buyer

STEP 10: Type BAFO Request Letters

to Buyer who writes contract award

STEP 11: Type Contract Award

EEO TWX

Type Contract

Type ROCA (pricing is typing PNM)

Type DD1499

Type DD350

Type FI 39 - Patent Rights

FI 59 - JAG review sheet

FI 66 - Committee review sheet

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 12: Make corrections to contract (buyer's)
and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 13: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 14: Make corrections to contract (JAG's)

STEP 15: Make corrections to contract (PMRC's)

STEP 16: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 17: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 18: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

Type Sorry Letters

Type Form Letters 12, 13, 87 for PCO signature

Send proposals to Staging

C8 COMPETITIVE BUY \$ 3,500,000 to \$10,000,000. Clerk's Steps

STEP 1: Type-up BSP Minutes Agenda

get RFP from Buyer

STEP 2: RFP

Type BSP Minutes for ASD/PMR signature

Prepare:

RFP

DD254 corrections

Acquisition Plan

Source List (FI 5)

D&F (FI 8)

Contract Type D&F (FI 9)

FI 59 - JAG review sheet

FI 66 - Committee review sheet

ASD/PMC review sheet

Set-up Contract File

to buyer

STEP 3: Make RFP Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 4: Make RFP Corrections (PCO's)

to buyer, PCO, JAG

STEP 5: Make RFP Corrections (JAG's)

to buyer, PCO

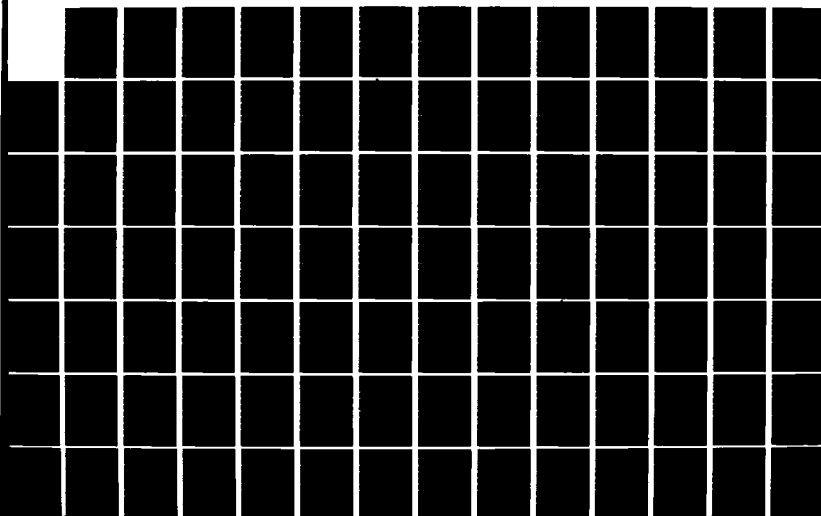
0-A135 639

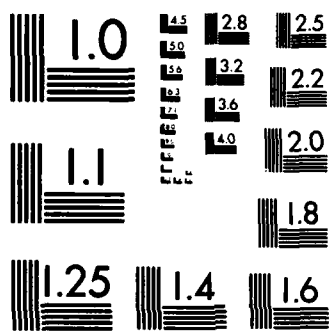
Q-GERT MODEL OF THE CONTRACTING CYCLE(U) AIR FORCE INST 5/8
OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYSTEMS AND
LOGISTICS C D MILLER SEP 83 AFIT-LSSR-118-83

UNCLASSIFIED

F/G 5/1

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

STEP 6: Make RFP Corrections (PMRC's)

to buyer, PCC

STEP 7: Make RFP Corrections (ASD/PMC)

to buyer, PCO

STEP 8: RFP to Repro

Prepare document for Repro
Type DD 843 (Repro form)

to Repro

STEP 9: Mail RFP

Check Reproduction

Type envelopes

Date stamp RFP

Put RFP in Mail

to offerors, request RFP Amendment

STEP 10: Type RFP Amendment and envelopes, mail

to offerors, buyer, Lab, buyer

STEP 11: Type Technically Unacceptable Letters and/or
single source justification (if required)

and type pre-negotiation presentation documents

to Buyer

STEP 12: Type BAFO Request Letters

to Buyer who writes contract award

STEP 13: Type Contract Award

EEO TWX

Type Contract

Type ROCA (pricing is typing PNM)

Type DD1499

Type DD350

Type FI 39 - Patent Rights

FI 59 - JAG review sheet

FI 66 - Committee review sheet

ASD/PMC review sheet and file

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 14: Make corrections to contract (buyer's)

and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 15: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 16: Make corrections to contract (JAG's)

STEP 17: Make corrections to contract (PMRC's)

STEP 18: Make corrections to contract (ASD/PMC)

STEP 19: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 20: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 21: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)
attach BV2 validation, CR01, DD350, contract, ROCA

Type Sorry Letters

Type Form Letters 12, 13, 87 for PCO signature

Send proposals to Staging

S2 SOLE SOURCE BUY \$ 10,000 to \$100,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP (letter or full)
DD254 corrections
Acquisition Plan
D&F (FI 8)
Contract Type D&F (FI 9)
Sole Source Justification (FI 2)

Set-up Contract File

to buyer

STEP 2: Make RFP Corrections (Buyer)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO)

to buyer, PCO

STEP 4: Mail RFP

Xerox RFP

Type envelope

Date stamp RFP

Put RFP in Mail

to offeror, buyer, Lab, buyer

STEP 5: Type Contract Award

Type Contract

Type ROCA

Type DD350

Type FI 39 - Patent Rights

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 6: Make corrections to contract (buyer)

to Buyer, PCO

STEP 7: Make corrections to contract (PCO)

to Buyer, PCO

STEP 8: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 9: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 10: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)
attach BV2 validation, CR01, DD350, contract, ROCA

Type Form Letters 12, 13, 87 for PCO signature

S3 SOLE SOURCE BUY \$ 100,000 to \$ 250,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP

DD254 corrections

Acquisition Plan

D&F (FI 8)

Contract Type D&F (FI 9)

Sole Source Justification (FI 2)

Set-up Contract File

to buyer

STEP 2: Make RFP Corrections (Buyer)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO)

to buyer, PCO

STEP 4: Mail RFP

Xerox RFP

Type envelope

Date stamp RFP

Put RFP in Mail

to offerors, buyer, Lab, buyer

STEP 5: Type Contract Award

Type Contract

Type ROCA

Type DD350

Type FI 39 - Patent Rights

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 6: Make corrections to contract (buyer's)

to Buyer, PCO

STEP 7: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 8: Make corrections to contract (JAG's)

STEP 9: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 10: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 11: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)
attach BV2 validation, CR01, DD350, contract, ROCA

Type Form Letters 12, 13, 87 for PCO signature

S4 SOLE SOURCE BUY \$ 250,000 to \$ 500,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP

DD254 corrections

Acquisition Plan

Sole Source Justification (FI 2)

D&F (FI 8)

Contract Type D&F (FI 9)

Set-up Contract File

to buyer

STEP 2: Make RFP Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO's)

to buyer, PCO, JAG

STEP 4: Make RFP Corrections (JAG's)

to buyer, PCO

STEP 5: Mail RFP

Xerox RFP

Type envelope

Date stamp RFP

Put RFP in Mail

to offerors, buyer, Lab, buyer

STEP 6: Type Contract Award

Type Contract

Type ROCA

Type DD350

Type FI 39 - Patent Rights

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 7: Make corrections to contract (buyer's)

to Buyer, PCO

STEP 8: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 9: Make corrections to contract (JAG's)

STEP 10: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 11: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 12: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)
attach BV2 validation, CR01, DD350, contract, ROCA

Type Form Letters 12, 13, 87 for PCO signature

S5 SOLE SOURCE BUY \$ 500,000 to \$ 750,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP

DD254 corrections

Acquisition Plan

Sole Source Justification (FI 2)

TPP (FI 8)

Contract Type D&F (FI 9)

Set-up RFP File

to buyer

STEP 2: Make RFP Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO's)

to buyer, PCO, JAG

STEP 4: Make RFP Corrections (JAG's)

to buyer, PCO

STEP 5: Make RFP Corrections (PMRC's)

to buyer, PCO

STEP 6: RFP to Repro

Prepare document for Repro
Type DD 843 (Repro form)

to Repro

STEP 7: Mail RFP

Check Reproduction
Type envelope
Date stamp RFP
Put RFP in Mail

to offerors, buyer, Lab, buyer

STEP 8: Type Contract Award

Type Contract
Type ROCA
Type DD350, DD1499, JAG sheet, Committee sheet
Type FI 39 - Patent Rights
Type Form Letter 8 (For Contractor's signature on contract)
with envelope
Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 9: Make corrections to contract (buyer's)

and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 10: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 11: Make corrections to contract (JAG's)

STEP 12: Make corrections to contract (PMRC's)

STEP 13: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 14: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 15: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

Type Form Letters 12, 13, 87 for PCO signature

S6 SOLE SOURCE BUY \$ 750,000 to \$ 1,000,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP
DD254 corrections
Acquisition Plan
Sole Source Justification (FI 2)
TPP (FI 8)
Contract Type D&F (FI 9)

Set-up RFP File

to buyer

STEP 2: Make RFP Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO's)

to buyer, PCO, JAG

STEP 4: Make RFP Corrections (JAG's)

to buyer, PCO

STEP 5: Make RFP Corrections (PMRC's)

to buyer, PCO

STEP 6: RFP to Repro

Prepare document for Repro
Type DD 843 (Repro form)

to Repro

STEP 7: Mail RFP

Check Reproduction
Type envelope
Date stamp RFP
Put RFP in Mail

to offerors, buyer, Lab, buver

STEP 8: Type Contract Award

Type Contract
Type ROCA
Type DD350, DD1499, JAG sheet, Committee sheet
Type FI 39 - Patent Rights
Type Form Letter 8 (For Contractor's signature on contract)
with envelope
Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 9: Make corrections to contract (buer's)

and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 10: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 11: Make corrections to contract (JAG's)

STEP 12: Make corrections to contract (PMRC's)

STEP 13: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 14: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 15: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

Type Form Letters 12, 13, 87 for PCO signature

S7 SOLE SOURCE BUY \$ 1,000,000 to \$ 3,500,000. Clerk's Steps

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP

DD254 corrections

Acquisition Plan

Sole Source Justification (FI 2)

D&F (FI 8)

Contract Type D&F (FI 9)

FI 59 - JAG review sheet

FI 66 - Committee review sheet

Set-up Contract File

to buyer

STEP 2: Make RFP Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO's)

to buyer, PCO, JAG

STEP 4: Make RFP Corrections (JAG's)

to buyer, PCO

STEP 5: Make RFP Corrections (PMRC's)

to buyer, PCO

STEP 6: RFP to Repro

Prepare document for Repro

Type DD 843 (Repro form)

to Repro

STEP 7: Mail RFP

Check Reproduction

Type envelope

Date stamp RFP

Put RFP in Mail

to offeror, request RFP Amendment

STEP 8: Type RFP Amendment and envelope, mail

to offeror, buyer, Lab, buyer

STEP 9: Type Contract Award

EEO TWX

Type Contract

Type ROCA (pricing is typing PNM)

Type DD1499

Type DD350,

Type FI 39 - Patent Rights

FI 59 - JAG review sheet

FI 66 - Committee review sheet

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 10: Make corrections to contract (buyer's)
and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 11: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 12: Make corrections to contract (JAG's)

STEP 13: Make corrections to contract (PMRC's)

STEP 14: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 15: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 16: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

Type Form Letters 12, 13, 87 for PCO signature

S8 SOLE SOURCE BUY \$ 3,500,000 to \$10,000,000. Clerk's Steps

STEP 1: Type-up BSP Minutes Agenda

get RFP from Buyer

STEP 2: RFP

Type BSP Minutes for ASD/PMR signature

Prepare:

RFP

DD254 corrections

Acquisition Plan

Sole Source Justification (FI 2)

D&F (FI 8)

Contract Type D&F (FI 9)

FI 59 - JAG review sheet

FI 66 - Committee review sheet

ASD/PMC review sheet

Set-up Contract File

to buyer

STEP 3: Make RFP Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 4: Make RFP Corrections (PCO's)

to buyer, PCO, JAG

STEP 5: Make RFP Corrections (JAG's)

to buyer, PCO

STEP 6: Make RFP Corrections (PMRC's)

to buyer, PCO

STEP 7: Make RFP Corrections (ASD/PMC)

to buyer, PCO

STEP 8: RFP to Repro

Prepare document for Repro
Type DD 843 (Repro form)

to Repro

STEP 9: Mail RFP

Check Reproduction

Type envelope

Date stamp RFP

Put RFP in Mail

to offeror, request RFP Amendment

STEP 10: Type RFP Amendment and envelope, mail

to offeror, buyer, Lab, buyer

STEP 11: Type pre-negotiation presentation documents

to Buyer who writes contract award

STEP 12: Type Contract Award

EEO TWX

Type Contract

Type ROCA (pricing is typing PNM)

Type DD1499

Type DD350

Type FI 39 - Patent Rights

FI 59 - JAG review sheet

FI 66 - Committee review sheet

ASD/PMC review sheet and file

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 13: Make corrections to contract (buyer's)
and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 14: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 15: Make corrections to contract (JAG's)

STEP 16: Make corrections to contract (PMRC's)

STEP 17: Make corrections to contract (ASD/PMC)

STEP 18: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 19: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 20: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)
attach BV2 validation, CRO1, DD350, contract, ROCA

Type Form Letters 12, 13, 87 for PCO signature

M2 CONTRACT MOD \$ 10,000 to \$100,000. Clerk's Steps

get letter from Buyer

STEP 1: Type letter to contractor with Statement of Work changes. Envelope. Carbons.

to buyer

STEP 2: Make Corrections (Buyer)

Type buyer's changes

to buyer, PCO

STEP 3: Make Corrections (PCO)

to buyer, PCO

to offeror, buyer, Lab, buyer

STEP 4: Type Modification

Type Modification

Type ROCA

Type DD350

FI 53

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Set-up contract file

to Buyer

STEP 5: Make corrections to Mod (buyer)

to Buyer, PCO

STEP 6: Make corrections to Mod (PCO)

to Buyer, PCO

STEP 7: Mail Mod to Contractor

Input 68X, 70E, 70H, 69K (BV2)

Xerox mod, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 8: Send Modification to Repro

Type DD 843, send contract to Bldg 5

STEP 9: Send Modification to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

M3 MODIFICATION \$ 100,000 to \$ 250,000. Clerk's Steps

get letter from Buyer

STEP 1: Type letter to contractor with Statement of Work changes. Envelope. Carbons.

to buyer

STEP 2: Make Corrections (Buyer)

Type buyer's changes

to buyer, PCO

STEP 3: Make Corrections (PCO)

to buyer, PCO

to offerors, buyer, Lab, buyer

STEP 4: Type Contract Modification

Type modification

Type ROCA

Type DD350

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Set-up Contract File

to Buyer

STEP 5: Make corrections to modification (buyer's)

to Buyer, PCO

STEP 6: Make corrections to modification (PCO's)

to Buyer, PCO

STEP 7: Make corrections to modification (JAG's)

STEP 8: Mail modification to Contractor

Input 68X, 70E, 70H, 69K (BV2)

Xerox modification, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 9: Send modification to Repro

Type DD 843, send modification to Bldg 5

STEP 10: Send to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

M4 MODIFICATION \$ 250,000 to \$ 500,000. Clerk's Steps

get letter from Buyer

STEP 1: Type letter to contractor with Statement of Work changes. Envelope. Carbons.

to buyer

STEP 2: Make Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make Corrections (PCO's)

to buyer, PCO

STEP 4: Type Modification

Type Modification

Type ROCA

Type DD350

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Set-up Contract File

to Buyer

STEP 5: Make corrections to Modification (buyer's)

to Buyer, PCO

STEP 6: Make corrections to Modification (PCO's)

to Buyer, PCO

STEP 7: Make corrections to Modification (JAG's)

STEP 8: Mail Modification to Contractor

Input 68X, 70E, 70H, 69K (BV2)

Xerox Modification, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 9: Send Modification to Repro

Type DD 843, send Modification to Bldg 5

STEP 10: Send Modification to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

M5 MODIFICATION \$ 500,000 to \$ 750,000. Clerk's Steps

get letter from Buyer

STEP 1: Type letter to contractor with Statement of Work changes. Envelope. Carbons.

to buyer

STEP 2: Make Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make Corrections (PCO's)

to buyer, PCO

to offerors, buyer, Lab, buyer

STEP 4: Type Modification

Type Modification

Type ROCA

Type DD350

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Set-up Contract File

to Buyer

STEP 5: Make corrections to Modification (buyer's)

and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 6: Make corrections to Modification (PCO's)

to Buyer, PCO

STEP 7: Make corrections (JAG's)

STEP 8: Make corrections (PMRC's)

STEP 9: Mail Modification to Contractor

Input 68X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 10: Send Modification to Repro

Type DD 843, send Modification to Bldg 5

STEP 11: Send Modification to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

M6 MODIFICATION \$ 750,000 to \$ 1,000,000. Clerk's Steps

get letter from Buyer

STEP 1: Type letter to contractor with Statement of Work changes. Envelope. Carbons.

to buyer

STEP 2: Make Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make Corrections (PCO's)

to buyer, PCO

to offerors, buyer, Lab, buyer

STEP 4: Type Modification Award

Type Modification

Type ROCA

Type DD350, DD1499

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Set-up Contract File

to Buyer

STEP 5: Make corrections to Modification (buyer's)

and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 6: Make corrections to Modification (PCO's)

to Buyer, PCO

STEP 7: Make corrections to Modification (JAG's)

STEP 8: Make corrections to Modification (PMRC's)

STEP 9: Mail Modification to Contractor

Input 68X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 10: Send Modification to Repro

Type DD 843, send Modification to Bldg 5

STEP 11: Send Modification to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

M7 MODIFICATION \$ 1,000,000 to \$ 3,500,000. Clerk's Steps

get Letter from Buyer

STEP 1: Type letter to contractor with statement of Work changes. Envelope. Carbons.

to buyer

STEP 2: Make Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 3: Make Corrections (PCO's)

STEP 4: Type pre-negotiation presentation documents

to Buyer

STEP 5: Type Modification

Type Modification

Type ROCA (pricing is typing PNM)

Type DD1499

Type DD350

FI 59 - JAG review sheet

FI 66 - Committee review sheet

Set-up Contract File

to buyer

STEP 6: Make corrections to Modification (Buyer's)

STEP 7: Make corrections to Modification (PCO's)

to Buyer, PCO

STEP 8: Make corrections to Modification (JAG's)

STEP 9: Make corrections to Modification (PMRC's)

STEP 10: Mail Modification to Contractor

Input 68X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 11: Send Modification to Repro

Type DD 843, send Modification to Bldg 5

STEP 12: Send Modification to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

M8 MODIFICATION \$ 3,500,000 to \$10,000,000. Clerk's Steps

STEP 1: Type-up BSP Minutes Agenda

get RFP letter from Buyer

STEP 2: RFP Letter

Type BSP Minutes for ASD/PMR signature

Prepare:
RFP letter

to buyer

STEP 3: Make Corrections (Buyer's)

Type buyer's changes

to buyer, PCO

STEP 4: Make Corrections (PCO's)

STEP 5: Make Corrections to BSP Minutes (PMRC's)

to buyer, PCO

STEP 6: Type pre-negotiation presentation documents

to Buyer who writes contract award

STEP 7: Type Contract Mod

Type Modification

Type ROCA (pricing is typing PNM)

Type DD1499

Type DD350

FI 59 - JAG review sheet

FI 66 - Committee review sheet

ASD/PMC review sheet and file

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

to Buyer

STEP 8: Make corrections to modification (buyer's)
and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 9: Make corrections to modification (PCO's)

to Buyer, PCO

STEP 10: Make corrections to modification (JAG's)

STEP 11: Make corrections to modification (PMRC's)

STEP 12: Make corrections to modification (ASD/PMC)

STEP 13: Mail Modification to Contractor

Input 55X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 14: Send modification to Repro

Type DD 843, send mod. to Bldg 5

STEP 15: Send Modification to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)
attach BV2 validation, CR01, DD350, contract, ROCA

STEP 1: Type Contract Award

Xerox entire file, set-up file

EEO TWX

Type Contract

Type ROCA (pricing is typing PNM)

Type DD1499

Type DD350

Type FI 39 - Patent Rights

FI 59 - JAG review sheet

FI 66 - Committee review sheet

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 2: Make corrections to contract (buyer's)

and Type-up Small Business Contracting Plan evaluation

to Buyer, PCO

STEP 3: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 4: Make corrections to contract (JAG's)

STEP 5: Make corrections to contract (PMRC's)

STEP 6: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 7: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 8: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

Type Sorry Letters

Type Form Letters 12, 13, 87 for PCO signature

Send proposals to Staging

F1 FUNDING

CLERK's STEPS

Receive PR from buyer

STEP 1: Type-up Funding. DD350. FI 53. FI 66.
Set-up File.

to buyer

STEP 2: Make corrections (buyer)

to buyer, PCO, PMRC

STEP 3: Make corrections (PMRC)

to buyer, PCO

STEP 4: Send to REPRO

DD843 (Repro)
Input 68X and 69K (BV2)

STEP 5: Send to Distribution

Type ASD258, attach BV2, CRO1, DD350

get RFP from Buyer

STEP 1: RFP

Prepare:
RFP
DD254 corrections
Acquisition Plan
Source List (FI 5)
D&F (FI 8)
Contract Type D&F (FI 9)

Set-up Contract File

to buyer

STEP 2: Make RFP Corrections (Buyer)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO)

to buyer, PCO

STEP 4: RFP to Repro

Prepare document for Repro
Type DD 843 (Repro form)

to Repro

STEP 5: Mail RFP

Check Reproduction

Type envelopes

Date stamp RFP

Put RFP in Mail

to offerors, buyer, Lab, buyer

STEP 6: Type Technically Unacceptable Letters and/or
single source justification (if required)

to Buyer

STEP 7: Type BAFO Request Letters

to Buyer who writes contract award

STEP 8: Type Contract Award

Type Contract

Type ROCA

Type DD350

Type FI 39 - Patent Rights

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 9: Make corrections to contract (buyer's)

to Buyer, PCO

STEP 10: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 11: Make corrections to contract (JAG's)

STEP 12: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 13: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 14: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

Type Sorry Letters

Type Form Letters 12, 13, 87 for PCO signature

Send proposals to Staging

get RFP from Buyer

STEP 1: RFP

Prepare:

RFP

DD254 corrections

Acquisition Plan

D&F (FI 8)

Contract Type D&F (FI 9)

Sole Source Justification (FI 2)

Set-up Contract File

to buyer

STEP 2: Make RFP Corrections (Buyer)

Type buyer's changes

to buyer, PCO

STEP 3: Make RFP Corrections (PCO)

to buyer, PCO

STEP 4: Mail RFP

Xerox RFP

Type envelope

Date stamp RFP

Put RFP in Mail

to offerors, buyer, Lab, buyer

STEP 5: Type Contract Award

Type Contract

Type ROCA

Type DD350

Type FI 39 - Patent Rights

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Get contractor's Administrative data (code, ACO, finance office, etc.)

to Buyer

STEP 6: Make corrections to contract (buyer's)

to Buyer, PCO

STEP 7: Make corrections to contract (PCO's)

to Buyer, PCO

STEP 8: Make corrections to contract (JAG's)

STEP 9: Mail Contract to Contractor

Input 67X, 70E, 70H, 69K (BV2)

Xerox contract, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 10: Send Contract to Repro

Type DD 843, send contract to Bldg 5

STEP 11: Send Contract to Distribution

Xerox 4 copies of ROCA

Type ASD 258 (distribution)

attach BV2 validation, CR01, DD350, contract, ROCA

Type Form Letters 12, 13, 87 for PCO signature

get letter from Buyer

STEP 1: Type letter to contractor with Statement of Work changes. Envelope. Carbons.

to buyer

STEP 2: Make Corrections (Buyer)

Type buyer's changes

to buyer, PCO

STEP 3: Make Corrections (PCO)

to buyer, PCO

to offerors, buyer, Lab, buyer

STEP 4: Type Contract Modification

Type modification

Type ROCA

Type DD350

Type Form Letter 8 (For Contractor's signature on contract)
with envelope

Set-up Contract File

to Buyer

STEP 5: Make corrections to modification (buyer's)

to Buyer, PCO

STEP 6: Make corrections to modification (PCO's)

to Buyer, PCO

STEP 7: Make corrections to modification (JAG's)

STEP 8: Mail modification to Contractor

Input 55X, 70E, 70H, 69K (BV2)

Xerox modification, attach to Form Letter 8

Mail to Contractor

to contractor, buyer, PCO

STEP 9: Send modification to Repro

Type DD 843, send modification to Bldg 5

receive letter to lab

STEP 1: Type letter to lab with attachment (Xerox)

to buyer, Lab, buyer

STEP 2: Type up Modification

Type Mod

Type 1 page ROCA (FI 53)

Type form letter 8 with envelope to contractor

Set-up File

to buyer, PCO, contractor, buyer, PCO

STEP 3: Send to Repro

Type DD843

Input 68X (BV2)

STEP 4: Send to Distribution

Type ASD 258, attach BV2, CRO1, DD350

receive change from buyer

STEP 1: Type up change and set-up file.

to buyer, PCO

STEP 2: Xerox change.

Input BV2 (68X, 70E, 70H, or 69K)

Attach BV2, CRO1, Xeroxed Mod, with ASD 258 to DIST.

OTHER DUTIES AS ASSIGNED

Mail - distribute

Timecards, morning report

Datacen Input

Validation

Manual records (PR's, others)

Post DIDS/AMSDL, DAR & SUPPS, Local Regs

Type for Branch Chief

Type letters for buyer (not connected with pending network)

Office supplies, forms

Sit-in for Divisional or Directorate Secretary

Filing

DD350 Input

Manhour Accounting (ASD 18)

APPENDIX G
ANALYSIS OF CLERK ESTIMATES

NETWORK C2

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.1	4.4	8.8
Std. Dev.	2.7	2.4	3.4
Median	6	4	8
Percent	54	26	20

Sample Size 11

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	1.0	2.7
Std. Dev.	1.3	1.2	2.3
Median	1	.5	2
Percent	62	19	19

Sample Size 11

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3	1.7	4
Std. Dev.	5.7	2.9	5.4
Median	1	.5	3
Percent	71	16	13

Sample Size 11

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.4
Std. Dev.	.1	.1	.3
Median	.3	.3	.3
Percent	78	15	7

Sample Size 11

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.8	1.9
Std. Dev.	.4	.2	.6
Median	1	.8	2
Percent	74	15	11

Sample Size 9

CLERK'S STEPS
NETWORK C2

PAGE 2

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.4	1.1
Std. Dev.	.3	.3	.6
Median	.5	.3	1
Percent	75	12	13
Sample Size	10		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.8	1.8
Std. Dev.	.9	.8	1.3
Median	.8	.5	1.5
Percent	80	9	11
Sample Size	10		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.1	3.9	7.7
Std. Dev.	2.8	2.7	3.6
Median	5	3	8.5
Percent	63	18	19
Sample Size	10		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	1.3	2.8
Std. Dev.	1.7	1.6	2.1
Median	1	.6	3
Percent	65	20	15
Sample Size			

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	1	2.3
Std. Dev.	1.1	1.2	1.4
Median	1	.6	2
Percent	69	16	15
Sample Size	10		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	1	2
Std. Dev.	1.3	.9	1.7
Median	1	.5	1.3
Percent	64	17	19
Sample Size	10		

Clerks' STEPS
NETWORK C2

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.4
Std. Dev.	.1	.1	.3
Median	.3	.3	.3
Percent	89	5	6
Number in Sample	10		

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.1	1.7	2.9
Std. Dev.	.9	1.1	.9
Median	2	1.5	3
Percent	73	15	12
Number in Sample	10		

REPRO TIME	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	19	11	27
Std. Dev.	4.1	4.1	4.1
Median	16	8	24
Percent	77	18	5
Number in Sample	8		

DISTRIBUTION	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	12	8	19
Std. Dev.	4	0	1
Median	12	8	20
Percent	85	5	10
Number in Sample	4		

NETWORK C3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.5	4.8	9.2
Std. Dev.	2.9	2.2	3.8
Median	6	4	9
Percent	-	-	-
Number in Sample	9		

Clerks' STEPS
NETWORK C3

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.7	4.5	8.7
Std. Dev.	2.6	2.7	4.2
Median	6	4	9
Percent	-	-	-
Number in Sample	9		
Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.5	1.3
Std. Dev.	1	.6	1.1
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		

NETWORK C4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.6	4.9	9.3
Std. Dev.	2.6	2	3.6
Median	6	4.5	9
Percent	-	-	-
Number in Sample	10		
Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.7	1.5
Std. Dev.	.9	1	1.2
Median	.5	.3	1
Percent	-	-	-
Number in Sample	10		
Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.6	4.5	8.5
Std. Dev.	2.5	2.7	4.3
Median	6	4.5	10
Percent	-	-	-
Number in Sample	10		

Clerks' STEPS
NETWORK C5

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.8	5.5	9.7
Std. Dev.	2.6	2.2	3.5
Median	7	6	9.5
Percent	-	-	-
Number in Sample	10		
Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.7	1.7	4
Std. Dev.	3.1	1.8	4.5
Median	1	.5	2
Percent	-	-	-
Number in Sample	10		
Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.9	1.9
Std. Dev.	.7	.8	1
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	9		
Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6	4.8	8.4
Std. Dev.	2.7	2.8	3.4
Median	7	6	10
Percent	-	-	-
Number in Sample	10		
Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.5	1.6	3.5
Std. Dev.	2.4	1.5	3.1
Median	2	1.3	2.8
Percent	-	-	-
Number in Sample	8		

Clerks' STEPS
NETWORK C6

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	7.8	5.8	10
Std. Dev.	3.7	2.6	4.6
Median	8	6	9.5
Percent	-	-	-
Number in Sample	10		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.9	5.0	9.5
Std. Dev.	3.4	3.4	6
Median	7	5	8
Percent	-	-	-
Number in Sample	10		

NETWORK C7

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	8.5	6.3	10.8
Std. Dev.	3.9	3.1	4.9
Median	8.5	7	11
Percent	-	-	-
Number in Sample	10		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	8.3	6.2	10.9
Std. Dev.	4.2	3.3	6.1
Median	8.5	7	11
Percent	-	-	-
Number in Sample	10		

NETWORK C8

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	1.5	2.2
Std. Dev.	2.4	2.5	2.6
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	9.3	7.3	12.3
Std. Dev.	4	2.9	6.4
Median	10	8	12
Percent	-	-	-
Number in Sample	8		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.6	2.2	3.2
Std. Dev.	2.5	2.5	3.6
Median	2	1	3
Percent	-	-	-
Number in Sample	9		

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	9.6	7.7	12.7
Std. Dev.	5	4.3	7.7
Median	10	8	11.5
Percent	-	-	-
Number in Sample	8		

Step 18	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2	1.8	2.6
Std. Dev.	3	3.1	2.9
Median	1	.5	2
Percent	-	-	-
Number in Sample	8		

NETWORK S2

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.1	3.5	7.2
Std. Dev.	4.6	2.7	7
Median	3	2	4
Percent	60	22	18
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.6	1.4
Std. Dev.	1.2	.6	1.5
Median	.5	.5	.5
Percent	54	32	14
Number in Sample	9		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.6	1.2
Std. Dev.	.7	.5	1.1
Median	1	.5	1
Percent	40	41	19
Number in Sample	9		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	1	1.9
Std. Dev.	1	.8	1.2
Median	1.5	.8	2.3
Percent	65	23	12
Number in Sample	8		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.9	3.8	7.1
Std. Dev.	2.9	2.9	4.9
Median	4.5	3	6
Percent	64	19	17
Number in Sample	8		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.8	1.5
Std. Dev.	1	.9	1.2
Median	.8	.5	1
Percent	49	32	19
Number in Sample	8		

Clerks' STEPS

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.7	1.4
Std. Dev.	.6	.5	.9
Median	1	.6	1.3
Percent	51	31	18
Number in Sample	8		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.9	1.7
Std. Dev.	.9	.9	1.3
Median	1	.9	1.3
Percent	63	21	16
Number in Sample	8		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.5
Std. Dev.	.2	.2	.2
Median	.3	.3	.5
Percent	75	17	8
Number in Sample	8		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.8	1.5
Std. Dev.	.6	.4	.8
Median	1	1	1.5
Percent	50	31	19
Number in Sample	8		

NETWORK S3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.8	4.6	7.5
Std. Dev.	3.4	3	4.6
Median	5	3.5	6.5
Percent	-	-	-
Number in Sample	8		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.1	3.6	7.4
Std. Dev.	2.6	2.4	4.6
Median	5	3	6.5
Percent	-	-	-
Number in Sample	8		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.8	1.7
Std. Dev.	1	.7	1.4
Median	.8	.5	1.1
Percent	-	-	-
Number in Sample	8		

NETWORK S4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.7	4.5	7.6
Std. Dev.	3.1	3.4	4.9
Median	5	3.5	6
Percent	-	-	-
Number in Sample	8		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.9	1.4	2.4
Std. Dev.	2.3	2	2.7
Median	.8	.5	1.1
Percent	-	-	-
Number in Sample	8		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.6	4.4	7.7
Std. Dev.	3.3	3.5	5
Median	5	3.5	6
Percent	-	-	-
Number in Sample	8		

Clerks' STEPS
NETWORK S5

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.8	4.4	7.1
Std. Dev.	3.6	2.9	4.5
Median	4	3	5
Percent	-	-	-
Number in Sample	7		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	1.2	2.3
Std. Dev.	1.1	1	1.3
Median	2	1	3
Percent	-	-	-
Number in Sample	7		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.6
Std. Dev.	.2	.2	.3
Median	.5	.3	.5
Percent	-	-	-
Number in Sample	7		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.6	4.3	8.1
Std. Dev.	3.9	3	7.6
Median	4	3	5
Percent	-	-	-
Number in Sample	7		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.8	1.8
Std. Dev.	1	.8	1.3
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	7		

NETWORK S6

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.1	4.6	7.6
Std. Dev.	3.7	3.1	4.7
Median	4.5	3.5	5.5
Percent	-	-	-
Number in Sample	7		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6	4.6	7.6
Std. Dev.	4.3	3.4	5.4
Median	4	3	5
Percent	-	-	-
Number in Sample	7		

NETWORK S7

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.6	5.2	8.1
Std. Dev.	3.8	3.1	4.7
Median	5	4	6
Percent	-	-	-
Number in Sample	7		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.9	1.7
Std. Dev.	1.2	.9	1.5
Median	1	.8	1.3
Percent	-	-	-
Number in Sample	7		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.9	5.2	8.9
Std. Dev.	4.4	3.6	5.8
Median	5.5	4.5	6.5
Percent	-	-	-
Number in Sample	7		

NETWORK S8

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.3	1.9	2.9
Std. Dev.	3.8	3.5	4.5
Median	.8	.5	1.3
Percent	-	-	-
Number in Sample	6		
Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.3	4.3	6.6
Std. Dev.	2.8	2.2	3
Median	5	4	6
Percent	-	-	-
Number in Sample	6		
Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	1.1	2.6
Std. Dev.	1.2	.8	1.7
Median	1.5	.9	2.5
Percent	-	-	-
Number in Sample	6		
Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.7	1.5
Std. Dev.	.7	.5	.8
Median	1	.5	1.3
Percent	-	-	-
Number in Sample	6		
Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.9	4	5.9
Std. Dev.	3	2.4	3.6
Median	4.5	3.5	5.5
Percent	-	-	-
Number in Sample	6		
Step 17	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.8	1.6
Std. Dev.	.6	.7	1
Median	1	.6	1.5
Percent	-	-	-
Number in Sample	5		

Clerks' STEPS

NETWORK M2

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.7	1.5
Std. Dev.	.6	.7	.9
Median	.8	.5	1.3
Percent	71	14	15
Number in Sample	6		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.6	1.1
Std. Dev.	.7	.8	.8
Median	.5	.3	1
Percent	63	14	23
Number in Sample	6		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.8	1.2
Std. Dev.	.7	.8	.8
Median	.3	.2	.5
Percent	69	13	28
Number in Sample	5		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.9	1.3	2.5
Std. Dev.	1.2	1.3	1.2
Median	2	1	3
Percent	76	18	6
Number in Sample	6		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.5	1.4
Std. Dev.	1.1	.7	1.4
Median	.5	.3	.8
Percent	59	28	13
Number in Sample	6		

Clerks' STEPS

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.3	.9
Std. Dev.	.4	.4	.6
Median	.3	.2	.7
Percent	64	26	10
Number in Sample	6		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.5	1.1
Std. Dev.	.7	.4	1.0
Median	.5	.4	.8
Percent	80	13	7
Number in Sample	6		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.4
Std. Dev.	.1	.1	.2
Median	.2	.2	.3
Percent	67	28	5
Number in Sample	6		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.6
Std. Dev.	.3	.2	.5
Median	.3	.3	.4
Percent	69	28	3
Number in Sample	6		

NETWORK M3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.6	1.2
Std. Dev.	.6	.7	.9
Median	.5	.3	.9
Percent	-	-	-
Number in Sample	6		

Clerks' STEPS

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2	1.4	2.8
Std. Dev.	1.1	1.3	1.3
Median	2	1	3
Percent	-	-	-
Number in Sample	6		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.7
Std. Dev.	.3	.1	.7
Median	.3	.3	.4
Percent	-	-	-
Number in Sample	6		

NETWORK M4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.6	1.0
Std. Dev.	.6	.7	.5
Median	.5	.3	.9
Percent	-	-	-
Number in Sample	6		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.3	1.7	3.1
Std. Dev.	1.5	1.7	1.7
Median	2.3	1.3	3.3
Percent	-	-	-
Number in Sample	6		

NETWORK M5

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.6	1.1
Std. Dev.	.6	.7	.6
Median	.5	.3	.9
Percent	-	-	-
Number in Sample	6		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.6	1.9	3.4
Std. Dev.	1.8	2.0	2.0
Median	2.3	1.3	3.3
Percent	-	-	-
Number in Sample	6		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.4	1.1
Std. Dev.	.3	.2	.6
Median	.8	.5	1.0
Percent	-	-	-
Number in Sample	5		

NETWORK M6

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.7	1.1
Std. Dev.	.6	.7	.6
Median	.6	.5	.9
Percent	-	-	-
Number in Sample	6		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.6	2.0	3.6
Std. Dev.	1.8	2.0	2.3
Median	2.3	1.3	3.3
Percent	-	-	-
Number in Sample	6		

NETWORK M7

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.9	1.6
Std. Dev.	1.0	1.0	1.3
Median	.9	.5	1.3
Percent	-	-	-
Number in Sample	6		

Clerks' STEPS

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.9	1.6
Std. Dev.	1.0	1.0	1.3
Median	.9	.5	1.3
Percent	-	-	-
Number in Sample	6		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	1.4	2.6
Std. Dev.	1.4	1.4	1.7
Median	1.5	.8	2.5
Percent	-	-	-
Number in Sample	6		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.5	2.7	4.3
Std. Dev.	3.2	3.0	3.4
Median	3	2	4
Percent	-	-	-
Number in Sample	5		

NETWORK M8

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	1.2	1.9
Std. Dev.	1.8	1.0	2
Median	.8	.5	1
Percent	-	-	-
Number in Sample	6		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.1	1.8	2.6
Std. Dev.	3.0	3.0	2.7
Median	1.0	.6	1.8
Percent	-	-	-
Number in Sample	6		

Clerks' STEPS

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.6	1.1
Std. Dev.	1.5	1.2	1.4
Median	.4	.2	.6
Percent	-	-	-
Number in Sample	6		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	1.4	2.5
Std. Dev.	1.3	1.4	1.5
Median	1.5	.8	2.5
Percent	-	-	-
Number in Sample	6		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.6	2.9	4.5
Std. Dev.	2.5	2.7	2.6
Median	3.5	2.5	4.5
Percent	-	-	-
Number in Sample	6		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.0	.8	1.4
Std. Dev.	1.0	1.0	1.4
Median	.6	.5	.9
Percent	-	-	-
Number in Sample	6		

NETWORK C9

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	9.1	6.3	11.4
Std. Dev.	5.6	3.6	7.7
Median	11	8	12.5
Percent	70	18	12
Number in Sample	6		

Clerks' STEPS

NETWORK F1

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.5	1.1
Std. Dev.	.3	.2	.6
Median	.6	.4	.9
Percent	78	15	7
Number in Sample	6		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.5
Std. Dev.	.3	.2	.4
Median	.2	.1	.3
Percent	62	31	7
Number in Sample	6		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.2	.1	.4
Std. Dev.	.2	.1	.4
Median	.1	.1	.1
Percent	47	47	6
Number in Sample	6		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.5
Std. Dev.	.4	.3	.5
Median	.2	.1	.3
Percent	75	16	9
Number in Sample	6		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.5
Std. Dev.	.3	.2	.4
Median	.2	.1	.3
Percent	66	29	5
Number in Sample	6		

NETWORK F2

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5	4.2	5.8
Std. Dev.	2	2.4	1.6
Median	4	3	5
Percent	75	16	9
Number in Sample	5		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.6	3.8	5.6
Std. Dev.	2.7	3.0	2.7
Median	3	2	4
Percent	64	19	17
Number in Sample			

NETWORK F3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.8	4	5.6
Std. Dev.	2.3	2.6	1.9
Median	4	3	5
Percent	79	15	6
Number in Sample	5		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.5	3.6	5.4
Std. Dev.	2.8	2.9	3
Median	3	2	4
Percent	65	20	15
Number in Sample	5		

NETWORK F4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.5	1.1	1.7
Std. Dev.	2.0	1.6	1.9
Median	.5	.4	.8
Percent	65	20	15
Number in Sample	5		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.4	1.9	3.3
Std. Dev.	1.1	1.3	1.7
Median	2	1.5	3
Percent	66	21	13
Number in Sample	5		

NETWORK M0

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.4
Std. Dev.	.2	.2	.2
Median	.3	.1	.3
Percent	81	14	5
Number in Sample	6		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.6	1.1
Std. Dev.	.6	.3	.8
Median	.8	.5	1.0
Percent	59	29	12
Number in Sample	6		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.3
Std. Dev.	.1	.1	.2
Median	.3	.2	.3
Percent	46	40	14
Number in Sample	6		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.4
Std. Dev.	.2	.1	.4
Median	.2	.1	.2
Percent	40	53	7
Number in Sample	6		

NETWORK A1

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.4	.8
Std. Dev.	.3	.2	.4
Median	.6	.4	.8
Percent	75	18	7
Number in Sample	6		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.3	.8
Std. Dev.	.7	.1	1.1
Median	.3	.3	.4
Percent	60	34	6
Number in Sample	6		

OTHER DUTIES 2.1 hours or 26% of day.

APPENDIX H
BUYER QUESTIONNAIRE

C2 COMPETITIVE BUY \$ 10,000 to \$ 100,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR
Review SOW
Review Contract Data Requirements List (DD1423)
Review Evaluation Criteria
Review Notes to Buyer
Compare SOW with TPP
Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254
Accept in Data-Cen, get RFP number

Write Small Business Coordination form
Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of Corrections

to PCO, Clerk, Repro, Clerk, and Contractor

STEP 6: Receive Proposals

Review of Proposals

Write Request for Technical Evaluation/ ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Write letter(s) to unacceptable(s) (if any)

Write letter to PMR if only one acceptable/ discuss/ resolve

STEP 8: Price Proposals

For Each Proposal in the Competitive Range

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates

Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO

Set-up Negotiation schedule with Engineer and Offerors

Draft Request for BAFO's

STEP 9: Negotiations (telephone)

For Each Proposal in the Competitive Range

Resolve technical issues

Discuss AF Objective

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Mail Request for BAFO's

STEP 10: Write-up Award

Review BAFO's / discuss with Engineer/ Source Select
with PCO

Write Contract

Write ROCA and file items

to Clerk

STEP 11: Review typed Award

Review contract

Review file

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO, Clerk, Contractor

STEP 15: Back from Contractor

Review / to PCO for Award

C3 COMPETITIVE BUY \$ 100,000 to \$ 250,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR
Review SOW
Review Contract Data Requirements List (DD1423)
Review Evaluation Criteria
Review Notes to Buyer
Compare SOW with TPP
Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of Corrections

to PCO, Clerk, Repro, Clerk, and Contractor

STEP 6: Receive Proposals

Review of Proposals

Write Request for Technical Evaluation/ ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Write letter(s) to unacceptable(s) (if any)

Write letter to PMR if only one acceptable/ discuss/ resolve

STEP 8: Price Proposals

For Each Proposal in the Competitive Range

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates

Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Branch Chief

Set-up Negotiation schedule with Engineer and Offerors

Draft BAFO's

STEP 9: Negotiations (telephone)

For Each Proposal in the Competitive Range
Resolve technical issues
Discuss AF Objective

Mail BAFO's

STEP 10: Write-up Award

Review BAFO's / discuss with Engineer/ Source Select
with PCO

Write Contract

Write ROCA and file items

to Clerk

STEP 11: Review typed Award

Review contract

Review file

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO

STEP 15: Take Contract to JAG

STEP 16: Make JAG required corrections

to clerk

STEP 17: Review typed corrections (JAG's)

to PCO, clerk, out-for-signature

STEP 18: Back from Contractor

Review / to PCO for Award

C4 COMPETITIVE BUY \$ 250,000 to \$ 500,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR
Review SOW
Review Contract Data Requirements List (DD1423)
Review Evaluation Criteria
Review Notes to Buyer
Compare SOW with TPP
Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's)

to PCO

STEP 6: Take RFP to JAG

STEP 7: Make JAG required Corrections

to clerk

STEP 8: Review of type Corrections (JAG's)

to PCO, Clerk, Repro, Clerk, and Contractor

STEP 9: Receive Proposals

Review of Proposals

Write Request for Technical Evaluation/ ask Engineer to pick-up

to Technical Evaluation

STEP 10: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Write letter(s) to unacceptable(s) (if any)

Write letter to PMR if only one acceptable/ discuss/ resolve

STEP 11: Price Proposals

For Each Proposal in the Competitive Range
Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG
Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Branch Chief

Set-up Negotiation schedule with Engineer and Offerors

Draft Request for BAFO's

STEP 12: Negotiations (telephone)

For Each Proposal in the Competitive Range
Resolve technical issues
Discuss AF Objective

Mail Request for BAFO's

STEP 13: Write-up Award

Review BAFO's / discuss with Engineer/ Source Select
with PCO

Write Contract

Write ROCA and file items

to Clerk

STEP 14: Review typed Award

Review contract

Review file

Write correction instructions to Clerk

to Clerk

STEP 15: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 16: Make PCO required Corrections

to clerk

STEP 17: Review typed corrections (PCO's)

to PCO

STEP 18: Take Contract to JAG

STEP 19: Make JAG required corrections

to clerk

STEP 20: Review typed corrections (JAG's)

to PCO, clerk, out-for-signature

STEP 21: Back from Contractor

Review / to PCO for Award

C5 COMPETITIVE BUY \$ 500,000 to \$ 750,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR
Review SOW
Review Contract Data Requirements List (DD1423)
Review Evaluation Criteria
Review Notes to Buyer
Compare SOW with TPP
Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's)

to PCO

STEP 6: Take RFP to JAG

STEP 7: Make JAG required Corrections

to clerk

STEP 8: Review of typed Corrections (JAG's)
(include time to carry to Committee)

to PCO, Committee

STEP 9: Make PMRC required Corrections

to clerk

STEP 10: Review of type corrections (PMRC's)

to PCO, Clerk, Repro, Clerk, and offerors

STEP 11: RFP Amendment

Evaluate offeror's request/ discuss with engineer/ PCO
Get changes from engineer/ Write up amendment

to clerk

STEP 12: Review amendment

to PCO , clerk, offerors

STEP 13: Receive Proposals

Review of Proposals

Write Request for Technical Evaluation/ ask Engineer to pick-up proposals

to Technical Evaluation

STEP 14: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Write letter(s) to unacceptable(s) (if any)

Write letter to PMR if only one acceptable/ discuss/ resolve

STEP 15: Price Proposals

For Each Proposal in the Competitive Range

Review Exceptions to Terms and Conditions/ discuss with PCO/JAG

Review Historical files/ call DCAA for rates

Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Branch Chief

Set-up Negotiation schedule with Engineer and Offerors

Draft Request for BAFO's

STEP 16: Negotiations (telephone)

For Each Proposal in the Competitive Range

Resolve technical issues

Discuss AF Objective

Mail Request for BAFO's

STEP 17: Write-up Award

Review BAFO's / discuss with Engineer/ Source Select
with PCO

Write Contract

Write ROCA and file items

to Clerk

STEP 18: Review typed Award

Review contract

Review file

Evaluate contractor's Subcontracting Plan, prepare
documentation

Write correction instructions to Clerk

to Clerk

STEP 19: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 20: Make PCO required Corrections

to clerk

STEP 21: Review typed corrections (PCO's)

to PCO

STEP 22: Take Contract to JAG

STEP 23: Make JAG required corrections to Award

to clerk

STEP 24: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 25: Make PMRC required corrections to Award

to clerk

STEP 26: Review of typed corrections (PMRC's)

to PCO, clerk, out-for-signature

STEP 27: Back from Contractor

Review / to PCO for Award

C6 COMPETITIVE BUY \$ 750,000 to \$ 1,000,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR
Review SOW
Review Contract Data Requirements List (DD1423)
Review Evaluation Criteria
Review Notes to Buyer
Compare SOW with TPP
Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's)

to PCO

STEP 6: Take RFP to JAG

STEP 7: Make JAG required Corrections

to clerk

STEP 8: Review of typed Corrections (JAG's)
(include time to carry to Committee)

to PCO, Committee

STEP 9: Make PMRC required Corrections

to clerk

STEP 10: Review of type corrections (PMRC's)

to PCO, Clerk, Repro, Clerk, and offerors

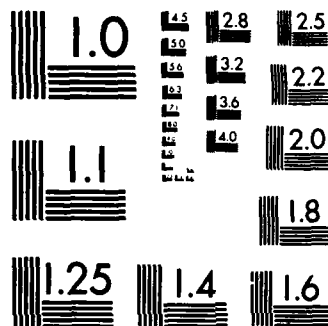
STEP 11: RFP Amendment

Evaluate offeror's request/ discuss with engineer/ PCO
Get changes from engineer/ Write up amendment

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to clerk

STEP 12: Review amendment

to PCO , clerk, offerors

STEP 13: Receive Proposals

Review of Proposals

Write Request for Technical Evaluation/ ask Engineer to pick-up

to Technical Evaluation

STEP 14: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Write letter(s) to unacceptable(s) (if any)

Write letter to PMR if only one acceptable/ discuss/ resolve

STEP 15: Price Proposals

For Each Proposal in the Competitive Range

Review Exceptions to Terms and Conditions/ discuss with PCO/JAG

Review Historical files/ call DCAA for rates

Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Division Chief

Set-up Negotiation schedule with Engineer and Offerors

Draft BAFO's

STEP 16: Negotiations (telephone)

For Each Proposal in the Competitive Range

Resolve technical issues

Discuss AF Objective

Mail BAFO's

STEP 17: Write-up Award

Review BAFO's / discuss with Engineer/ Source Select
with PCO

Request Small Business Subcontracting Plan

Write Contract

Write ROCA and file items

to Clerk

STEP 18: Review typed Award

Review contract

Review file

Evaluate contractor's Subcontracting Plan, prepare
documentation

Write correction instructions to Clerk

to Clerk

STEP 19: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 20: Make PCO required Corrections

to clerk

STEP 21: Review typed corrections (PCO's)

to PCO

STEP 22: Take Contract to JAG

STEP 23: Make JAG required corrections to Award

to clerk

STEP 24: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 25: Make PMRC required corrections to Award

to clerk

STEP 26: Review of typed corrections (PMRC's)

to PCO, clerk, out-for-signature

STEP 27: Back from Contractor

Review / to PCO for Award

C7 COMPETITIVE BUY \$ 1,000,000 to \$ 3,500,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR
Review SOW
Review Contract Data Requirements List (DD1423)
Review Evaluation Criteria
Review Notes to Buyer
Compare SOW with TPP
Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's)

to PCO

STEP 6: Take RFP to JAG

STEP 7: Make JAG required Corrections

to clerk

STEP 8: Review of typed Corrections (JAG's)
(include time to carry to Committee)

to PCO, Committee

STEP 9: Make PMRC required Corrections

to clerk

STEP 10: Review of type corrections (PMRC's)

to PCO, Clerk, Repro, Clerk, and offerors

STEP 11: RFP Amendment

Evaluate offeror's request/ discuss with engineer/ PCO
Get changes from engineer/ Write up amendment

to clerk

STEP 12: Review amendment

to PCO , clerk, offerors

STEP 13: Receive Proposals

Review of Proposals

Write Request for Technical Evaluation/ ask Engineer to pick-up

to Technical Evaluation

STEP 14: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Write letter(s) to unacceptable(s) (if any)

Write letter to PMR if only one acceptable/ discuss/ resolve

Request PMRP perform Pricing

STEP 15: Price Proposals

For Each Proposal in the Competitive Range

Review Exceptions to Terms and Conditions/ discuss with PCO/JAG

(PMRP performs pricing)

Set-up Negotiation schedule with Engineer and Offerors

Draft BAFO's

Draft documents for pre-negotiation meeting

clerk types pre-neq documents

STEP 16: Conduct Pre-negotiation Presentation for Director

STEP 17: Negotiations (telephone or face-to-face)

For Each Proposal in the Competitive Range
Resolve technical issues
Discuss AF Objective

Mail BAFO's

STEP 18: Write-up Award

Review BAFO's / discuss with Engineer/ discuss with
price analyst/ Source Select with PCO

Request Small Business Subcontracting Plan

Write Contract

Write ROCA (Pricing is writing the PNM) and file items
(including DD1499)

Request EEO clearance

to Clerk

STEP 19: Review typed Award

Review contract

Review file

Evaluate contractor's Subcontracting Plan, prepare
documentation

Write correction instructions to Clerk

to Clerk

STEP 20: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 21: Make PCO required Corrections

to clerk

STEP 22: Review typed corrections (PCO's)

to PCO

STEP 23: Take Contract to JAG

STEP 24: Make JAG required corrections to Award

to clerk

STEP 25: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 26: Make PMRC required corrections to Award

to clerk

STEP 27: Review of typed corrections (PMRC's)

to PCO, clerk, out-for-signature

STEP 28: Back from Contractor

Review / to PCO and PMRC for Final Review

STEP 29: Final Corrections for PMRC or Director/ to dist.

C8 COMPETITIVE BUY \$ 3,500,000 to \$10,000,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR

Review SOW

Review Contract Data Requirements List (DD1423)

Review Evaluation Criteria

Review Notes to Buyer

Draft D&F

Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Prepare for BSP with Director / draft minutes

to clerk

STEP 2: Conduct BSP with Director

STEP 3: Write Solicitation

Rewrite BSP Minutes

Write RFP

Write Acquisition Plan

to Clerk

STEP 4: RFP back from Clerk

Review BSP Minutes

Review RFP

Review File

to Clerk

STEP 5: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

STEP 6: Make PCO required Corrections

to Clerk

STEP 7: Review of typed Corrections (PCO's)

to PCO

STEP 8: Take RFP to JAG

STEP 9: Make JAG required Corrections

to clerk

STEP 10: Review of typed Corrections (JAG's)
(include time to carry to Committee)

to PCO, Committee

STEP 11: Make PMRC required Corrections

to clerk

STEP 12: Review of type corrections (PMRC's)

to PCO, ASD/PMC

STEP 13: Make ASD/PMC required Corrections

to clerk

STEP 14: Review of typed Corrections (ASD/PMC)

to PCO, Clerk, Repro, Clerk, and offerors

STEP 15: RFP Amendment

Evaluate offeror's request/ discuss with engineer/ PCO
Get changes from engineer/ Write up amendment

to clerk

STEP 16: Review amendment

to PCO , clerk, offerors

STEP 17: Receive Proposals

Review of Proposals

Write Request for Technical Evaluation/ ask Engineer to
pick-up

to Tecnnical Evaluation

STEP 18: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Write letter(s) to unacceptable(s) (if any)

Write letter to PMR if only one acceptable/ discuss/
resolve

Request PMRP perform Pricing

wait for audit

STEP 19: Price Proposals

For Each Proposal in the Competitive Range
Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

(PMRP performs pricing)

Set-up Negotiation schedule with Engineer and Offerors

Draft BAFO's

Draft documents for pre-negotiation meeting

clerk types pre-neg documents

**STEP 20: Conduct Pre-negotiation Presentation for Director
and ASD/PM**

STEP 21: Negotiations (telephone or face-to-face)

For Each Proposal in the Competitive Range
Resolve technical issues
Discuss AF Objective

Mail BAFO's

STEP 22: Write-up Award

Review BAFO's / discuss with Engineer/ discuss with
price analyst/ Source Select with PCO

Request Small Business Subcontracting Plan

Write Contract

Write ROCA (Pricing is writing the PNM) and file items
(including DD1499)

Request EEO clearance

to Clerk

STEP 23: Review typed Award

Review contract

Review file

Evaluate contractor's Subcontracting Plan, prepare documentation

Write correction instructions to Clerk

to Clerk

STEP 24: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 25: Make PCO required Corrections

to clerk

STEP 26: Review typed corrections (PCO's)

to PCO

STEP 27: Take Contract to JAG

STEP 28: Make JAG required corrections to Award

to clerk

STEP 29: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 30: Make PMRC required corrections to Award

to clerk

STEP 31: Review of typed corrections (PMRC's)

to PCO, ASD/PMC

STEP 32: Make ASD/PMC required Corrections to Award

Prepare 3 day hold TWX

to clerk

STEP 33: Review of typed corrections (ASD/PMC)

to PCO, clerk, out-for-signature

STEP 34: Back from Contractor

Review / to PCO, PMRC, PMC for Final Review

STEP 35: Final Corrections for PMRC, PMC, PM / to dist.

S2 SOLE SOURCE BUY \$ 10,000 to \$ 100,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR
Review SOW
Review Contract Data Requirements List (DD1423)
Review Notes to Buyer
Sole Source Justification
Compare SOW with TPP
Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of Corrections

to PCO, Clerk, Repro, Clerk, and Contractor

STEP 6: Receive Proposal

Review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 8: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO

Set-up Negotiation schedule with Engineer and Offeror

STEP 9: Negotiations (telephone)

Resolve technical issues
Negotiate a reasonable price

STEP 10: Write-up Award

Write Contract

Write ROCA and file items

to Clerk

STEP 11: Review typed Award

Review contract

Review file

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO, Clerk, Contractor

STEP 15: Back from Contractor

Review / to PCO for Award

S3 SOLE SOURCE BUY \$ 100,000 to \$ 250,000. Buver's Steps

STEP 1: Review PR and Write-up RFP

Review PR
 Review SOW
 Review Contract Data Requirements List (DD1423)
 Review Notes to Buyer
 Review Sole Source Justification
 Compare SOW with TPP
Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of Corrections

to PCO, Clerk, Repro, Clerk, and Contractor

STEP 6: Receive Proposal

Review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 8: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO

Set-up Negotiation schedule with Engineer and Offeror

STEP 9: Negotiations (telephone)

Resolve technical issues
Negotiate a reasonable price

STEP 10: Write-up Award

Write Contract

Write ROCA and file items

to clerk

STEP 11: Review typed Award

Review contract

Review file

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO

STEP 15: Take Contract to JAG

STEP 16: Make JAG required corrections

to clerk

STEP 17: Review typed corrections (JAG's)

to PCO, clerk, out-for-signature

STEP 18: Back from Contractor

Review / to PCO for Award

S4 SOLE SOURCE BUY \$ 250,000 to \$ 500,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review Sole Source Justification

Review PR

Review SOW

Review Contract Data Requirements List (DD1423)

Review Notes to Buyer

Compare SOW with TPP

Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's)

to PCO

STEP 6: Take RFP to JAG

STEP 7: Make JAG required Corrections

to clerk

STEP 8: Review of type Corrections (JAG's)

to PCO, Clerk, Repro, Clerk, and Contractor

STEP 9: Receive Proposal

Review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 10: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 11: Price Proposals

Review Exceptions to Terms and Conditions/ discuss

with PCO/JAG
Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Branch Chief

Set-up Negotiation schedule with Engineer and Offeror

STEP 12: Negotiations (telephone)

Resolve technical issues
Discuss AF Objective and negotiate agreement

STEP 13: Write-up Award

Write Contract
Write ROCA and file items

to Clerk

STEP 14: Review typed Award

Review contract
Review file
Write correction instructions to Clerk

to Clerk

STEP 15: Review Corrections (buyer's)

Review corrections
Sign ROCA and other file items

to PCO

STEP 16: Make PCO required Corrections

to clerk

STEP 17: Review typed corrections (PCO's)

to PCO

STEP 18: Take Contract to JAG

STEP 19: Make JAG required corrections

to clerk

STEP 20: Review typed corrections (JAG's)

to PCO, clerk, out-for-signature

STEP 21: Back from Contractor

Review / to PCO for Award

S5 SOLE SOURCE BUY \$ 500,000 to \$ 750,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review Sole Source Justification

Review PR

Review SOW

Review Contract Data Requirements List (DD1423)

Review Notes to Buyer

Compare SOW with TPP

Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's)

to PCO

STEP 6: Take RFP to JAG

STEP 7: Make JAG required Corrections

to clerk

STEP 8: Review of typed Corrections (JAG's)
(include time to carry to Committee)

to PCO, Committee

STEP 9: Make PMRC required Corrections

to clerk

STEP 10: Review of type corrections (PMRC's)

to PCO, Clerk, Repro, Clerk, and offerors

STEP 11: Receive Proposal

Review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 12: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 13: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Branch Chief

Set-up Negotiation schedule with Engineer and Offeror

STEP 14: Negotiations (telephone)

Resolve technical issues

Discuss AF Objective and negotiate price

STEP 15: Write-up Award

Request Small Business Subcontracting Plan

Write Contract

Write ROCA and file items

to Clerk

STEP 16: Review typed Award

Review contract

Review file

Evaluate contractor's Subcontracting Plan, prepare
documentation

Write correction instructions to Clerk

to Clerk

STEP 17: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 18: Make PCO required Corrections

to clerk

STEP 19: Review typed corrections (PCO's)

to PCO

STEP 20: Take Contract to JAG

STEP 21: Make JAG required corrections to Award

to clerk

STEP 22: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 23: Make PMRC required corrections to Award

to clerk

STEP 24: Review of typed corrections (PMRC's)

to PCO, clerk, out-for-signature

STEP 25: Back from Contractor

Review / to PCO for Award

S6 SOLE SOURCE BUY \$ 750,000 to \$ 1,000,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review Sole Source Justification

Review PR

Review SOW

Review Contract Data Requirements (DD1423)

Review Notes to Buyer

Compare SOW with TPP

Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's)

to PCO

STEP 6: Take RFP to JAG

STEP 7: Make JAG required Corrections

to clerk

STEP 8: Review of typed Corrections (JAG's)
(include time to carry to Committee)

to PCO, Committee

STEP 9: Make PMRC required Corrections

to clerk

STEP 10: Review of type corrections (PMRC's)

to PCO, Clerk, Repro, Clerk, and offerors

STEP 11: Receive Proposal

Review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 12: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 13: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG
Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Division Chief

Set-up Negotiation schedule with Engineer and Offeror

STEP 14: Negotiations (telephone)

Resolve technical issues
Discuss AF Objective and negotiate price

STEP 15: Write-up Award

Request Small Business Subcontracting Plan

Write Contract

Write ROCA and file items

to Clerk

STEP 16: Review typed Award

Review contract

Review file

Evaluate contractor's Subcontracting Plan, prepare
documentation

Write correction instructions to Clerk

to Clerk

STEP 17: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 18: Make PCO required Corrections

to clerk

STEP 19: Review typed corrections (PCO's)

to PCO

STEP 20: Take Contract to JAG

STEP 21: Make JAG required corrections to Award

to clerk

STEP 22: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 23: Make PMRC required corrections to Award

to clerk

STEP 24: Review of typed corrections (PMRC's)

to PCO, clerk, out-for-signature

STEP 25: Back from Contractor

Review / to PCO for Award

S7 SOLE SOURCE BUY \$ 1,000,000 to \$ 3,500,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review Sole Source Justification

Review PR

Review SOW

Review Contract Data Requirements List (DD1423)

Review Notes to Buyer

Compare SOW with TPP

Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's)

to PCO

STEP 6: Take RFP to JAG

STEP 7: Make JAG required Corrections

to clerk

STEP 8: Review of typed Corrections (JAG's)
(include time to carry to Committee)

to PCO, Committee

STEP 9: Make PMRC required Corrections

to clerk

STEP 10: Review of type corrections (PMRC's)

to PCO, Clerk, Repro, Clerk, and offerors

STEP 11: RFP Amendment

Evaluate offeror's request/ discuss with engineer/ PCO
Get changes from engineer/ Write up amendment

to clerk

STEP 12: Review amendment

to PCO , clerk, offerors

STEP 13: Receive Proposal

Review of Proposal

Write Request for Technical Evaluation/ ask Engineer to pick-up

to Technical Evaluation

STEP 14: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Request PMRP perform Pricing

STEP 15: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

(PMRP performs pricing)

Set-up Negotiation schedule with Engineer and Offeror

Draft documents for pre-negotiation meeting

clerk types pre-neg documents

STEP 16: Conduct Pre-negotiation Presentation for Director

STEP 17: Negotiations (telephone or face-to-face)

Resolve technical issues
Negotiate and reach agreement

STEP 18: Write-up Award

Request Small Business Subcontracting Plan

Write Contract

Write ROCA (Pricing is writing the PNM) and file items
(including DDL499)

Request EEO clearance

to Clerk

STEP 19: Review typed Award

Review contract

Review file

Evaluate contractor's Subcontracting Plan, prepare
documentation

Write correction instructions to Clerk

to Clerk

STEP 20: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 21: Make PCO required Corrections

to clerk

STEP 22: Review typed corrections (PCO's)

to PCO

STEP 23: Take Contract to JAG

STEP 24: Make JAG required corrections to Award

to clerk

STEP 25: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 26: Make PMRC required corrections to Award

to clerk

STEP 27: Review of typed corrections (PMRC's)

to PCO, clerk, out-for-signature

STEP 28: Back from Contractor

Review / to PCO and PMRC for Final Review

STEP 29: Final Corrections for PMRC or Director/ to dist.

S8 SOLE SOURCE BUY \$ 3,500,000 to \$10,000,000.

Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review Sole Source Justification

Review PR

Review SOW

Review Contract Data Requirements List (DD1423)

Draft D&F

Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Prepare for BSP with Director / draft minutes

to clerk

STEP 2: Conduct BSP with Director

STEP 3: Write Solicitation

Rewrite BSP Minutes

Write RFP

Write Acquisition Plan

to Clerk

STEP 4: RFP back from Clerk

Review BSP Minutes

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 5: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

STEP 6: Make PCO required Corrections

to Clerk

STEP 7: Review of typed Corrections (PCO's)

to PCO

STEP 8: Take RFP to JAG

STEP 9: Make JAG required Corrections

to clerk

STEP 10: Review of typed Corrections (JAG's)
(include time to carry to Committee)

to PCO, Committee

STEP 11: Make PMRC required Corrections

to clerk

STEP 12: Review of typed Corrections (PMRC's)

to PCO, ASD, PMC

STEP 13: Make ASD/PMC required Corrections

to clerk

STEP 14: Review of typed Corrections (ASD/PMC)

to PCO, Clerk, Repro, Clerk, and offerors

STEP 15: RFP Amendment

Evaluate offeror's request/ discuss with engineer/ PCO
Get changes from engineer/ Write up amendment

to clerk

STEP 16: Review amendment

to PCO , clerk, offeror

STEP 17: Receive Proposal

Review of Proposal

Write Request for Technical Evaluation/ ask Engineer to pick-up

to Technical Evaluation

STEP 18: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Request PMRP perform Pricing

wait for audit

STEP 19: Price Proposal

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

(PMRP performs pricing)

Set-up Negotiation schedule with Engineer and Offerors
Draft documents for pre-negotiation meeting

clerk types pre-neg documents

STEP 20: Conduct Pre-negotiation Presentation for Director
and ASD/PM

STEP 21: Negotiations (telephone or face-to-face)

Negotiate a Fair and Reasonable Price

STEP 22: Write-up Award

Request Small Business Subcontracting Plan

Write Contract

Write ROCA (Pricing is writing the PNM) and file items
(including DD1499)

Request EEO clearance

to Clerk

STEP 23: Review typed Award

Review contract

Review file

Evaluate contractor's Subcontracting Plan, prepare
documentation

Write correction instructions to Clerk

to Clerk

STEP 24: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 25: Make PCO required Corrections

to clerk

STEP 26: Review typed corrections (PCO's)

to PCO

STEP 27: Take Contract to JAG

STEP 28: Make JAG required corrections to Award

to clerk

STEP 29: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 30: Make PMRC required corrections to Award

to clerk

STEP 31: Review of typed corrections (PMRC's)

to PCO, ASD/PMC

STEP 32: Make ASD/PMC required Corrections to Award

Prepare 3 day hold TWX

to clerk

STEP 33: Review of typed corrections (ASD/PMC)

to PCO, clerk, out-for-signature

STEP 34: Back from Contractor

Review / to PCO, PMRC, PMC for Final Review

STEP 35: Final Corrections for PMRC, PMC, PM / to dist.

M2 CONTRACT MOD \$ 10,000 to \$ 100,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR
Review SOW
Review Contract Data Requirements List (DD1423)
Review Notes to Buyer
Mod Justification

Discuss PR problems with Engineer

Accept in Data-Cen

Write RFP

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of Corrections

to PCO, Clerk, Repro, Clerk, and Contractor

STEP 6: Receive Proposal

Review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 8: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO

Set-up Negotiation schedule with Engineer and Offeror

STEP 9: Negotiations (telephone)

Resolve technical issues
Negotiate a reasonable price

STEP 10: Write-up Award

Write Contract Modification

Write ROCA and file items

to Clerk

STEP 11: Review typed Award

Review contract

Review file

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO, Clerk, Contractor

STEP 15: Back from Contractor

Review / to PCO for Award

M3 CONTRACT MOD \$ 100,000 to \$ 250,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR

Review SOW

Review Contract Data Requirements List (DD1423)

Review Notes to Buyer

Discuss PR problems with Engineer

Accept in Data-Cen

Write RFP letter

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Write Correction Instructions to Clerk

to Clerk

STEP 3: Review corrections

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of Corrections / Mail

to PCO and Contractor

STEP 6: Receive Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 8: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Branch Chief

Set-up Negotiation schedule with Engineer and Offerors

STEP 9: Negotiations (telephone)

Resolve technical issues
Negotiate modification

STEP 10: Write-up Award

Write modification

Write ROCA and file items

to Clerk

STEP 11: Review typed Award

Review modification

Review file

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO

STEP 15: Take modification to JAG

STEP 16: Make JAG required corrections

to clerk

STEP 17: Review typed corrections (JAG's)

to PCO, clerk, out-for-signature

STEP 18: Back from Contractor

Review / to PCO for Award

M4 MODIFICATION \$ 250,000 to \$ 500,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review Sole Source Justification

Review PR

Review SOW

Review Contract Data Requirements List (DD1423)

Review Notes to Buyer

Discuss PR problems with Engineer

Accept in Data-Cen

Write RFP letter

to Clerk

STEP 2: Letter back from Clerk

Review letter to contractor with changes

Write Correction Instructions to Clerk

to Clerk

STEP 3: Corrections back from Clerk

Review corrections

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's) / Mail

to PCO and Contractor

STEP 6: Receive Proposal

Review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 8: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Branch Chief

Set-up Negotiation schedule with Engineer and Offeror

STEP 9: Negotiations (telephone)

Resolve technical issues
Discuss AF Objective and negotiate agreement

STEP 10: Write-up Award

Write Modification

Write ROCA and file items

to Clerk

STEP 11: Review typed Award

Review Modification

Review file

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO

STEP 15: Take Contract to JAG

STEP 16: Make JAG required corrections

to clerk

STEP 17: Review typed corrections (JAG's)

to PCO, clerk, out-for-signature

STEP 18: Back from Contractor

Review / to PCO for Award

M5 MODIFICATION \$ 500,000 to \$ 750,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR
Review SOW
Review Contract Data Requirements List (DDL423)
Review Notes to Buyer

Discuss PR problems with Engineer

Accept in Data-Cen

Write RFP letter

to Clerk

STEP 2: Letter back from Clerk

Review RFP letter

Write Correction Instructions to Clerk

to Clerk

STEP 3: Letter Corrections back from Clerk

Review corrections

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's)

to PCO and offeror

STEP 6: Receive Proposal

Review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 8: Price Proposal

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Branch Chief

Set-up Negotiation schedule with Engineer and Offeror

STEP 9: Negotiations (telephone)

Resolve technical issues
Discuss AF Objective and negotiate price

STEP 10: Write-up Award

Request Small Business Subcontracting Plan

Write Modification

Write ROCA and file items

to Clerk

STEP 11: Review typed Award

Review Modification

Review file

Evaluate contractor's Subcontracting Plan, prepare
documentation

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO

STEP 15: Take Contract to JAG

STEP 16: Make JAG required corrections to Award

to clerk

STEP 17: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 18: Make PMRC required corrections to Award

to clerk

STEP 19: Review of typed corrections (PMRC's)

to PCO, clerk, out-for-signature

STEP 20: Back from Contractor

Review / to PCO for Award

M6 MODIFICATION \$ 750,000 to \$ 1,000,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR
Review SOW
Review Contract Data Requirements (DDL423)
Review Notes to Buyer

Discuss PR problems with Engineer

Accept in Data-Cen

Write RFP letter

to Clerk

STEP 2: RFP back from Clerk

Review RFP letter

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's)/Mail

to PCO and contractor

STEP 6: Receive Proposal

Review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 8: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates

Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Division Chief

Set-up Negotiation schedule with Engineer and Offeror

STEP 9: Negotiations (telephone)

Resolve technical issues

Discuss AF Objective and negotiate price

STEP 10: Write-up Award

Request Small Business Subcontracting Plan

Write Modification

Write ROCA and file items

to Clerk

STEP 11: Review typed Award

Review Modification

Review file

Evaluate contractor's Subcontracting Plan, prepare
documentation

528

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO

STEP 15: Take Contract to JAG

STEP 16: Make JAG required corrections to Award

to clerk

STEP 17: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 18: Make PMRC required corrections to Award

to clerk

STEP 19: Review of typed corrections (PMRC's)

to PCO, clerk, out-for-signature

STEP 20: Back from Contractor
Review / to PCO for Award

M7 MODIFICATION \$ 1,000,000 to \$ 3,500,000.

Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR

Review SOW

Review Contract Data Requirements List (DDL423)

Review Notes to Buyer

Discuss PR problems with Engineer

Accept in Data-Cen

Write RFP letter

to Clerk

STEP 2: RFP letter back from Clerk

Review RFP letter

Write Correction Instructions to Clerk

to Clerk

STEP 3: Corrections back from Clerk

Review corrections

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Review of typed Corrections (PCO's)

to PCO and contractor

STEP 6: Receive Proposal

Review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Request PMRP perform Pricing

STEP 8: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

(PMRP performs pricing)

Set-up Negotiation schedule with Engineer and Offeror

Draft documents for pre-negotiation meeting

clerk types pre-neg documents

STEP 9: Conduct Pre-negotiation Presentation for Director

STEP 10: Negotiations (telephone or face-to-face)

Resolve technical issues
Negotiate and reach agreement

STEP 11: Write-up Award

Request Small Business Subcontracting Plan

Write Modification

Write ROCA (Pricing is writing the PNM) and file items
(including DD1499)

to Clerk

STEP 12: Review typed Award

Review Modification

Review file

Evaluate contractor's Subcontracting Plan, prepare documentation

Write correction instructions to Clerk

to Clerk

STEP 13: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 14: Make PCO required Corrections

to clerk

STEP 15: Review typed corrections (PCO's)

to PCO

STEP 16: Take Contract to JAG

STEP 17: Make JAG required corrections to Award

to clerk

STEP 18: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 19: Make PMRC required corrections to Award

to clerk

STEP 20: Review of typed corrections (PMRC's)

to PCO, clerk, out-for-signature

STEP 21: Back from Contractor

Review / to PCO and PMRC for Final Review

STEP 22: Final Corrections for PMRC or Director/ to dist.

M8 MODIFICATION \$ 3,500,000 to \$10,000,000. Buyer's Steps

STEP 1: Review PR and Write-up RFP

Review PR
Review SOW
Review Contract Data Requirements List (DD1423)

Discuss PR problems with Engineer

Accept in Data-Cen

Prepare for BSP with Director / draft minutes

to clerk

STEP 2: Conduct BSP with Director

STEP 3: Write Solicitation

Rewrite BSP Minutes

Write RFP letter

to Clerk

STEP 4: RFP back from Clerk

Review BSP Minutes

Review RFP

Write Correction Instructions to Clerk

to Clerk

STEP 5: RFP Corrections back from Clerk

Review corrections

Sign BSP Minutes

STEP 6: Make PCO required Corrections

to Clerk

STEP 7: Review of typed Corrections (PCO's)

to PCO, Committee (BSP Minutes)

STEP 8: Make PMRC required Corrections to BSP Minutes

to clerk

STEP 9: Review of typed Corrections (PMRC's)

to PCO, ASD/PMC (BSP Minutes)

to PCO and offerors

STEP 10: Receive Proposal

Review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 11: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Request PMRP perform Pricing

wait for audit

STEP 12: Price Proposal

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

(PMRP performs pricing)

Set-up Negotiation schedule with Engineer and Offerors

Draft documents for pre-negotiation meeting

clerk types pre-neg documents

STEP 13: Conduct Pre-negotiation Presentation for Director
and ASD/PM

STEP 14: Negotiations (telephone or face-to-face)
Negotiate a Fair and Reasonable Price

STEP 15: Write-up Award

Request Small Business Subcontracting Plan

Write Contract Modification

Write ROCA (Pricing is writing the PNM) and file items
(including DD1499)

to Clerk

STEP 16: Review typed Award

Review contract modification

Review file

Evaluate contractor's Subcontracting Plan, prepare
documentation

Write correction instructions to Clerk

to Clerk

STEP 17: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 18: Make PCO required Corrections

to clerk

STEP 19: Review typed corrections (PCO's)

to PCO

STEP 20: Take Contract to JAG

STEP 21: Make JAG required corrections to Award

to clerk

STEP 22: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 23: Make PMRC required corrections to Award

to clerk

STEP 24: Review of typed corrections (PMRC's)

to PCO, ASD/PMC

STEP 25: Make ASD/PMC required Corrections to Award

to clerk

STEP 26: Review of typed corrections (ASD/PMC)

to PCO, clerk, out-for-signature

STEP 27: Back from Contractor

Review / to PCO, PMRC, PMC for Final Review

STEP 28: Final Corrections for PMRC, PMC, PM / to dist.

STEP 1: Write-up Award

Review BAFO's / discuss with Engineer/ discuss with
price analyst/ Source Select with PCO

Request Small Business Subcontracting Plan

Write Contract

Write ROCA (Pricing is writing the PNM) and file items
(including DD1499)

Request EEO clearance

to Clerk

STEP 2: Review typed Award

Review contract

Review file

Evaluate contractor's Subcontracting Plan, prepare
documentation

Write correction instructions to Clerk

to Clerk

STEP 3: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 4: Make PCO required Corrections

to clerk

STEP 5: Review typed corrections (PCO's)

to PCO

STEP 6: Take Contract to JAG

STEP 7: Make JAG required corrections to Award

to clerk

STEP 8: Review typed corrections (JAG's)
(include time to carry to PMRC)

to PCO, PMRC

STEP 9: Make PMRC required corrections to Award

to clerk

STEP 10: Quick review of typed corrections (PMRC's)

to PCO, clerk, out-for-signature

STEP 11: Back from Contractor

Quick review / to PCO and PMRC for Final Review

STEP 12: Final Corrections for PMRC or Director/ to dist.

STEP 1: Review PR and Write-up RFP

Review PR

Review SOW

Review Contract Data Requirements List (DD1423)

Review Evaluation Criteria

Review Notes to Buyer

Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Quick Review of Corrections

to PCO, Clerk, Repro, Clerk, and Contractor

STEP 6: Receive Proposals

Quick review of Proposals

Write Request for Technical Evaluation/ ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

Write letter(s) to unacceptable(s) (if any)

Write letter to PMR if only one acceptable/ discuss/ resolve

STEP 8: Price Proposals

For Each Proposal in the Competitive Range

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates

Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Branch Chief

Set-up Negotiation schedule with Engineer and Offerors

Draft BAFO's

STEP 9: Negotiations (telephone)

For Each Proposal in the Competitive Range

Resolve technical issues

Discuss AF Objective

Mail BAFO's

STEP 10: Write-up Award

Review BAFO's / discuss with Engineer/ Source Select
with PCO

Write Contract

Write POCA and file items

to Clerk

STEP 11: Review typed Award

Review contract

Review file

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO

STEP 15: Take Contract to JAG

STEP 16: Make JAG required corrections

to clerk

STEP 17: Review typed corrections (JAG's)

to PCO, clerk, out-for-signature

STEP 18: Back from Contractor

Quick review / to PCO for Award

STEP 1: Review PR and Write-up RFP

Review PR

Review SOW

Review Contract Data Requirements List (DD1423)

Review Notes to Buyer

Review Sole Source Justification

Discuss PR problems with Engineer

Check Sources Sought Synopsis / DD254

Accept in Data-Cen, get RFP number

Write Small Business Coordination form

Informal BSP with PCO / Division Chief

Write RFP

Write Acquisition Plan

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Review File

Write Correction Instructions to Clerk

to Clerk

STEP 3: RFP Corrections back from Clerk

Review corrections

Sign Acquisition Plan

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Quick Review of Corrections

to PCO, Clerk, Repro, Clerk, and Contractor

STEP 6: Receive Proposal

Quick review of Proposal

Ask Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 8: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Branch Chief

Set-up Negotiation schedule with Engineer and Offeror

STEP 9: Negotiations (telephone)

Resolve technical issues
Discuss AF Objective and negotiate price

STEP 10: Write-up Award

Write Contract

Write ROCA and file items

to Clerk

STEP 11: Review typed Award

Review contract

Review file

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO

STEP 15: Take Contract to JAG

STEP 16: Make JAG required corrections

to clerk

STEP 17: Review typed corrections (JAG's)

to PCO, clerk, out-for-signature

STEP 18: Back from Contractor

Quick review / to PCO for Award

STEP 1: Review PR and Write-up RFP

Review PR

Review SOW

Review Contract Data Requirements List (DD1423)

Review Notes to Buyer

Discuss PR problems with Engineer

Accept in Data-Cen

Write RFP letter

to Clerk

STEP 2: RFP back from Clerk

Review RFP

Write Correction Instructions to Clerk

to Clerk

STEP 3: Review corrections

to PCO

STEP 4: Make PCO required Corrections

to Clerk

STEP 5: Quick Review of Corrections / Mail

to PCO and Contractor

STEP 6: Receive ProposalAsk Engineer to pick-up

to Technical Evaluation

STEP 7: Receive Technical Evaluation

Review Tech Eval/ resolve problems with Engineer

STEP 8: Price Proposals

Review Exceptions to Terms and Conditions/ discuss
with PCO/JAG

Review Historical files/ call DCAA for rates
Compute AF Cost Objective and Profit Objective

Pre-negotiation with PCO / Branch Chief

Set-up Negotiation schedule with Engineer and Offerors

STEP 9: Negotiations (telephone)

Resolve technical issues
Negotiate modification

STEP 10: Write-up Award

Write modification

Write ROCA and file items

to Clerk

STEP 11: Review typed Award

Review modification

Review file

Write correction instructions to Clerk

to Clerk

STEP 12: Review Corrections (buyer's)

Review corrections

Sign ROCA and other file items

to PCO

STEP 13: Make PCO required Corrections

to clerk

STEP 14: Review typed corrections (PCO's)

to PCO

STEP 15: Take modification to JAG

STEP 16: Make JAG required corrections

to clerk

STEP 17: Review typed corrections (JAG's)

to PCO, clerk, out-for-signature

STEP 18: Back from Contractor

Quick review / to PCO for Award

FI FUNDING

Buyer's Steps

STEP 1: Ask Contractor for letter. Accept in Data-Cen

to clerk

STEP 2: Review Fundings and send back for corrections

to clerk

STEP 3: Review corrections. Sign FI 53.

to PCO, PMRC, clerk

STEP 4: Review corrections (PMRC). To PCO for award.

MO

NO COST SUPPLEMENTAL AGREEMENT

BUYER'S STEPS

Receive letter from contractor

STEP 1: Write letter to Lab

clerk types

STEP 2: Review and sign letter to Lab

Lab sends back recommendation

STEP 3: Negotiate change with contractor.

Write Modification

Write Justification

clerk types

STEP 4: Review change, sign file

PCO reviews, out to contractor

STEP 5: Quick review / give to PCO

A1 Administrative Change Buyer's Steps

STEP 1: Write up change

Receive request for correction or change.

Write up change.

Input DATA-CEN

to typing

STEP 2: Review change

to PCO, award

OTHER DUTIES AS ASSIGNED

Security Check

Administer contracts

Write letters on awarded contracts

Go to Meetings

Go to training classes/ PMR meetings/ Security meetings

Branch or Division meetings

Terminate contracts

Participate in reviews (C/SSR, technical, etc.)

Delinquent Contract Reports

Management Reviews / reports

Answer Freedom of Information requests

Keep-up on new regulations, policy letters, etc.

Update Data-Cen

Fill-out travel vouchers / TDY forms for trips

Draft RFPs

APPENDIX I
ANALYSIS OF BUYER ESTIMATES

Buyers' STEPS
NETWORK C2

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	10.9	7.44	18.88
Std. Dev.	6.7	4.44	12.96
Median	10	6	16
Percent	45	19	36
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2	1.32	3.57
Std. Dev.	1.8	1.37	3.56
Median	1	.5	2
Percent	52	16	32
Number in Sample	9		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.07	.589	1.78
Std. Dev.	1.02	.644	1.37
Median	.5	.3	1.5
Percent	50	20	30
Number in Sample	9		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.38	.657	2.42
Std. Dev.	1.14	.655	1.7
Median	1	.5	1.5
Percent	54	20	26
Number in Sample	9		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.94	.51	1.44
Std. Dev.	.97	.64	1.19
Median	.5	.3	1
Percent	55	18	27
Number in Sample	9		

Solicitation Period	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	182.6	144	271.5
Std. Dev.	18.66	37.4	34
Median	176	140	264
Percent	57	15	28
Number in Sample	8		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	2.5	1.52	5.3
Std. Dev.	1.22	.9	4.4
Median	3	2	4
Percent	51	22	27
Number in Sample	9		

Technical Eval.	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	164.5	116	247.7
Std. Dev.	47.5	37.8	68
Median	176	100	240
Percent	54	18	28
Number in Sample	8		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	4.94	3.05	8.55
Std. Dev.	4.3	2.8	8.95
Median	4	2	6
Percent	52	22	26
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	12.4	8.55	17.9
Std. Dev.	18.4	12.3	24
Median	6	4	12
Percent	52	21	27
Number in Sample	9		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	3.25	1.83	5.67
Std. Dev.	1.86	1.12	3.7
Median	3	2	4
Percent	52	21	27
Number in Sample			

Out BAFO	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	87.5	60	125
Std. Dev.	31.95	18.5	50
Median	80	60	120
Percent	53	19	28
Number in Sample	8		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	11.67	6.67	19
Std. Dev.	9.56	4.27	15.95
Median	10	8	18
Percent	48	20	32
Number in Sample	9		
Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.1	1.3	4.1
Std. Dev.	1.9	1.4	3.6
Median	1	.5	3
Percent	60	18	22
Number in Sample	9		
Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.86	.46	1.7
Std. Dev.	.62	.4	1.2
Median	1	.5	1.5
Percent	46	17	27
Number in Sample	9		
Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.57	1.97
Std. Dev.	.9	.63	1.32
Median	1	.5	2
Percent	54	19	27
Number in Sample	9		
Step 14	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.72	.57	1.97
Std. Dev.	.65	.4	.91
Median	.5	.25	1
Percent	55	17	28
Number in Sample	9		
Contractor Sign	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	75	42.5	122
Std. Dev.	9.25	8.3	33.6
Median	80	40	120
Percent	50	20	30
Number in Sample	8		

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.4	2
Std. Dev.	.9	.3	1.9
Median	1	.5	1.5
Percent	55	21	24
Number in Sample	9		

NETWORK C3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	14.7	9.4	22.4
Std. Dev.	11.8	7.6	20.3
Median	10	6	16
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.9	1.2	3.4
Std. Dev.	1.9	1.4	3.6
Median	1	.5	2
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	13.5	9.1	21
Std. Dev.	18.2	12.3	24.3
Median	8	4	16
Percent	-	-	-
Number in Sample	9		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.5	1.8	6.5
Std. Dev.	2.6	1.5	5.6
Median	3	1	4
Percent	-	-	-
Number in Sample	9		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	12.1	7	18.9
Std. Dev.	9.8	4.9	15.1
Median	1	.5	3
Percent	-	-	-
Number in Sample	9		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	2	1.2	4
Std. Dev.	1.8	1.4	3.5
Median	1	.5	3
Percent	-	-	-
Number in Sample	9		

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.7	.5	1
Std. Dev.	.2	.2	.4
Median	.5	.5	1
Percent	46	27	27
Number in Sample	9		

JAG Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	28	14	49.5
Std. Dev.	8.6	5.7	12.8
Median	24	16	48
Percent	47	19	34
Number in Sample	8		

Step 16	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.4	.6	3.4
Std. Dev.	.9	.4	2.4
Median	1	.5	3.5
Percent	52	24	24
Number in Sample	9		

Step 17	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.8	.4	1.6
Std. Dev.	.6	.3	1.4
Median	.8	.5	1
Percent	49	24	27
Number in Sample	9		

NETWORK C4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	15	10.6	23
Std. Dev.	11.6	8	20.5
Median	12	8	16
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2	1.2	3.2
Std. Dev.	1.3	.9	2.5
Median	2	1	3
Percent	-	-	-
Number in Sample	9		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.5	.9
Std. Dev.	.3	.2	.4
Median	.5	.5	.8
Percent	50	24	26
Number in Sample	9		

JAG RFP Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	31	15	49.5
Std. Dev.	13.3	5.1	14.2
Median	24	16	44
Percent	47	18	35
Number in Sample	8		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.5	.5	3.4
Std. Dev.	1.2	.4	2.4
Median	1	.5	3.5
Percent	51	21	28
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.3	1.4
Std. Dev.	.6	.3	1.1
Median	.5	.3	1
Percent	51	22	27
Number in Sample	9		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	11.7	7.3	19.7
Std. Dev.	11.7	7.2	23.8
Median	10	4	15
Percent	-	-	-
Number in Sample	9		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4	2.1	7.4
Std. Dev.	3.1	1.7	6.3
Median	4	2	5
Percent	-	-	-
Number in Sample	9		

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	15.4	9.6	26.2
Std. Dev.	12.5	6.3	25.6
Median	10	8	14
Percent	-	-	-
Number in Sample	9		

Step 14	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.9	1.2	3.3
Std. Dev.	1.3	.9	2.7
Median	2	1	3
Percent	-	-	-
Number in Sample	9		

NETWORK C5

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	16.4	11.5	25
Std. Dev.	12.2	8.8	20.5
Median	16	8	22
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.1	1.2	3.4
Std. Dev.	1.3	.85	2.4
Median	2	1	3
Percent	-	-	-
Number in Sample	9		

PMRC RFP Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	26	13.5	46.5
Std. Dev.	10.3	7	14.5
Median	24	10	48
Percent	49	19	32
Number in Sample	8		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.7	1.3	4.9
Std. Dev.	1.8	1.2	3.8
Median	3	1	5
Percent	47	19	34
Number in Sample	9		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.4	1.5
Std. Dev.	.5	.3	.8
Median	1	.5	1.5
Percent	53	19	28
Number in Sample	9		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.6	1.3	4.9
Std. Dev.	1.2	.6	3.2
Median	3	1	4.5
Percent	52	22	26
Number in Sample	8		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.3	.7
Std. Dev.	.3	.3	.3
Median	.4	.2	.6
Percent	55	23	22
Number in Sample	8		

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	9.4	6.1	17.3
Std. Dev.	7.2	5.3	17.6
Median	6	3	16
Percent	-	-	-
Number in Sample	9		

Step 16	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.4	2.6	7.8
Std. Dev.	3.8	2.6	7.3
Median	3	1.5	5
Percent	-	-	-
Number in Sample	9		

Step 17	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	14.75	9.75	21.2
Std. Dev.	12.7	7.75	19.2
Median	12.5	8	16.5
Percent	-	-	-
Number in Sample	8		

Step 18	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3	1.8	5.1
Std. Dev.	2.4	1.2	3.9
Median	3	2	6
Percent	-	-	-
Number in Sample	9		

PMRC Contract	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	27	14	47.5
Std. Dev.	9.5	7.2	13.6
Median	24	12	48
Percent	50	19	31
Number in Sample	8		

Step 25	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.4	1.8	6.8
Std. Dev.	2.5	1.9	5.5
Median	3	1	5
Percent	46	20	34
Number in Sample	9		

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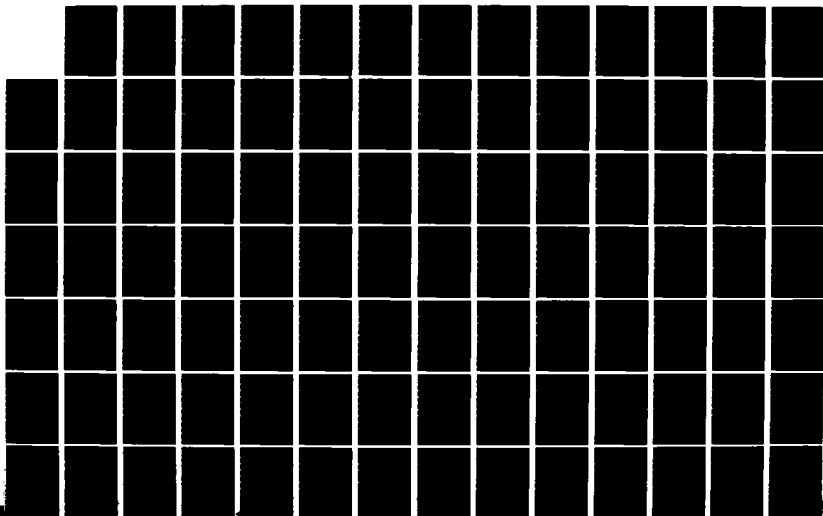
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OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYSTEMS AND
LOGISTICS C D MILLER SEP 83 AFIT-LSSR-118-83

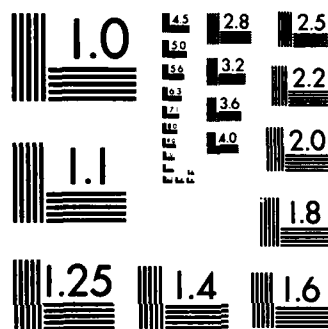
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Buyers' STEPS

Step 26	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.6	1.8
Std. Dev.	.6	.3	1.1
Median	1	.7	2
Percent	48	23	29
Number in Sample	9		

NETWORK C6

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	14.6	7.8	25.4
Std. Dev.	8.1	4.4	13.9
Median	14.5	7	24
Percent	51	17	32
Number in Sample	8		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.1	.8	3.6
Std. Dev.	1.8	.5	2.1
Median	1.5	.8	3
Percent	58	18	24
Number in Sample	8		

Audit	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	317.7	216	535.7
Std. Dev.	60.7	80.3	245.2
Median	352	176	528
Percent	60	20	20
Number in Sample	8		
\$ Level			

Competitive 2M
Sole Source 1.75M
Modification 500K

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	11.6	7.8	25.1
Std. Dev.	10.2	7.7	26
Median	10	5.5	17
Percent	56	18	26
Number in Sample	8		

Step 16	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	13.8	8.2	21.4
Std. Dev.	27.3	16.4	40.1
Median	2	1	4.5
Percent	61	18	21
Number in Sample	8		

Step 17	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	13.1	6.9	20.5
Std. Dev.	12.3	5.0	19.0
Median	11	6.5	18
Percent	60	19	21
Number in Sample	8		

Out BAFO	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	61.6	38.8	103
Std. Dev.	18.4	12.6	21.1
Median	64	40	108
Percent	58	22	20
Number in Sample	8		

Step 27	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.5	4.4
Std. Dev.	1.3	.4	5.4
Median	.5	.3	3
Percent	62	19	19
Number in Sample	7		

NETWORK C7

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	17.9	10.3	34.9
Std. Dev.	10	7.2	23.1
Median	17	7.5	27
Percent	-	-	-
Number in Sample	8		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.4	2.0	8.9
Std. Dev.	5.1	2.5	12.8
Median	3	1.5	5
Percent	-	-	-
Number in Sample	8		

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	12.9	8.4	28.7
Std. Dev.	15.3	10.3	36.9
Median	7	4.8	11.5
Percent	-	-	-
Number in Sample	8		

Step 16	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.5	2.9
Std. Dev.	.4	.3	1.2
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		

Step 17	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	8.2	4.0	17.9
Std. Dev.	11.8	5.9	24.5
Median	2	1	4
Percent	-	-	-
Number in Sample	7		

Step 18	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	10.4	6.8	18.4
Std. Dev.	9.8	6.5	18.2
Median	6	5	12
Percent	-	-	-
Number in Sample	7		

Step 19	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.6	2.5	6.5
Std. Dev.	3.4	2.6	5.6
Median	2	1	4.5
Percent	-	-	-
Number in Sample	7		

Buyers' STEPS

Step 28	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.1	2	5.3
Std. Dev.	4.2	2.8	5.3
Median	1	.8	4
Percent	-	-	-
Number in Sample	7		

Step 29	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	.6	3.2
Std. Dev.	1.4	.8	2.4
Median	1	.3	2.0
Percent	-	-	-
Number in Sample	7		

NETWORK C8

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	20.1	12.4	33
Std. Dev.	11.7	8.1	13.9
Median	24	8	32
Percent	48	20	32
Number in Sample	7		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	.9	3.4
Std. Dev.	.7	.6	1.2
Median	2.0	1.0	4
Percent	56	19	25
Number in Sample	7		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	13.1	9.1	21.7
Std. Dev.	9.9	8.3	16
Median	12	8	20
Percent	-	-	-
Number in Sample	7		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.4	2.2	5.2
Std. Dev.	2.4	1.8	3
Median	3	2	5
Percent	-	-	-
Number in Sample	7		

ASD/PMC RFP Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	29.1	13.7	58.3
Std. Dev.	9.4	6	22.5
Median	32	16	56
Percent	51	15	34
Number in Sample	7		

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.3	1.4	4.3
Std. Dev.	2.6	2.1	3.8
Median	2	1	3
Percent	65	19	16
Number in Sample	7		

Step 14	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.4	2.3
Std. Dev.	.6	.3	2.6
Median	.8	.4	1.4
Percent	-	-	-
Number in Sample	8		

Step 19	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	13.2	5.4	22
Std. Dev.	11.2	3.6	17.7
Median	15	7	20
Percent	-	-	-
Number in Sample	7		

Step 20	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.1	.9	4
Std. Dev.	1.4	.5	2.8
Median	2	1	3
Percent	-	-	-
Number in Sample	7		

Step 21	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	11.8	6.4	23.4
Std. Dev.	16.8	9.6	33.6
Median	3	2	4
Percent	-	-	-
Number in Sample	7		

Step 22	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	9	5.6	15.1
Std. Dev.	5.9	4	11
Median	10	5	15
Percent	-	-	-
Number in Sample	7		

ASD/PMC K Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	24.9	13.9	51.4
Std. Dev.	10.6	8.6	21.6
Median	24	16	40
Percent	57	11	32
Number in Sample	7		

Step 32	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.5	1.4	4.6
Std. Dev.	2	1.3	2.2
Median	2	1	5
Percent	65	19	16
Number in Sample	7		

Step 33	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.5	2.2
Std. Dev.	1.1	.5	1.7
Median	.5	.3	1
Percent	60	22	18
Number in Sample	7		

Step 34	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.2	1.9	7.1
Std. Dev.	5.5	2.8	8.1
Median	2	1	3
Percent	-	-	-
Number in Sample	7		

Step 35	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	8.1	3.8	13.9
Std. Dev.	11	6.1	16.7
Median	1	.5	7
Percent	-	-	-
Number in Sample	7		

NETWORK S2

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	11.9	8.2	21.3
Std. Dev.	10.2	7.3	18.8
Median	8	6	12
Percent	48	18	34
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.8	2.3
Std. Dev.	1.2	.9	2
Median	.8	.5	1
Percent	57	19	24
Number in Sample	9		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.4	1.4
Std. Dev.	.7	.4	1.3
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.6	1.9
Std. Dev.	.8	.4	1.3
Median	1	.5	2
Percent	-	-	-
Number in Sample	9		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.4	1.1
Std. Dev.	.6	.3	1
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		

Solicitation Time	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	160.8	105	253.3
Std. Dev.	32	41.8	34
Median	176	104	264
Percent	52	21	27
Number in Sample	8		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.4	.4	1.1
Std. Dev.	.6	.3	1
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		

Technical Eval.	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	117	82	185.5
Std. Dev.	53.4	43.3	78.1
Median	104	70	208
Percent	45	22	33
Number in Sample	8		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	2.8	1.7	5.2
Std. Dev.	1.7	1.1	3.6
Median	2	1	3.5
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	5.2	3.7	13.3
Std. Dev.	4.1	3.4	16.5
Median	5	4	8
Percent	-	-	-
Number in Sample	9		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	6.9	4.7	10.6
Std. Dev.	4.9	3.6	7.4
Median	8	4	10
Percent	-	-	-
Number in Sample	9		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.6	1	2.6
Std. Dev.	1.2	.9	2.1
Median	1	.5	2
Percent	-	-	-
Number in Sample	9		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.4	1.4
Std. Dev.	.6	.4	.9
Median	.5	.3	2
Percent	-	-	-
Number in Sample	9		

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.76	.41	1.54
Std. Dev.	.65	.4	.9
Median	.5	.17	1
Percent	-	-	-
Number in Sample	9		

Contractor Sign	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	71.5	38	120
Std. Dev.	11.8	10.3	21.4
Median	80	40	120
Percent	-	-	-
Number in Sample	8		

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.45	1.8
Std. Dev.	.64	.26	1.4
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	9		

NETWORK S3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	10.3	7.5	19.8
Std. Dev.	7.3	5.3	17.6
Median	8.5	6.5	16
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	1	2.5
Std. Dev.	1.2	.9	1.8
Median	1	.5	2
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.1	4.2	12.8
Std. Dev.	5.2	3.7	13.6
Median	5	4	8
Percent	-	-	-
Number in Sample	9		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.5	2.3	8.2
Std. Dev.	3.6	2.7	9.7
Median	2	1	4
Percent	-	-	-
Number in Sample	9		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	7	4.7	10.6
Std. Dev.	4.8	3.6	7.6
Median	6	4	10
Percent	-	-	-
Number in Sample	9		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	1.1	3
Std. Dev.	1.2	.9	2.2
Median	1.5	1	2
Percent	-	-	-
Number in Sample	9		

Step 16	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.6	3.2
Std. Dev.	.7	.4	2.3
Median	1.5	.5	3
Percent	-	-	-
Number in Sample	9		

JAG Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	28	14	5
Std. Dev.	6	5.7	.4
Median	24	16	
Percent	-	-	-
Number in Sample	8		

Step 17	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.5	1.7
Std. Dev.	.7	.4	1.2
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	9		

Step 18	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.5	1.8
Std. Dev.	.5	.3	1.2
Median	1	.5	2
Percent	-	-	-
Number in Sample	9		

NETWORK S4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	11.4	8.3	18.9
Std. Dev.	8	6.2	14.8
Median	9.5	7	16
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	1.1	2.6
Std. Dev.	1.2	.9	1.8
Median	1	.8	2
Percent	-	-	-
Number in Sample	9		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.5	.9
Std. Dev.	.3	.3	.4
Median	.5	.5	1
Percent	-	-	-
Number in Sample	9		

JAG RFP Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	26	14	46
Std. Dev.	7.1	5.7	10.9
Median	24	16	40
Percent	-	-	-
Number in Sample	8		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.5	2.2
Std. Dev.	.6	.4	1.1
Median	1	.5	2
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.4	1.2
Std. Dev.	.6	.3	.9
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5	3.3	8.7
Std. Dev.	2.5	2	6.6
Median	5	3	8
Percent	-	-	-
Number in Sample	9		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.8	1.6	6.1
Std. Dev.	1.7	.9	5.6
Median	2.5	1	5
Percent	-	-	-
Number in Sample	9		

Buyers' STEPS

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	8	5.1	14.1
Std. Dev.	6.8	4.7	13.9
Median	6	4	12
Percent	-	-	-
Number in Sample	9		

Step 14	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	1.1	2.9
Std. Dev.	1.2	.9	2.4
Median	1.5	1	2
Percent	-	-	-
Number in Sample	9		

Step 21	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.6	1.9
Std. Dev.	.6	.3	1.8
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	9		

NETWORK S5

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	12.8	9.4	20.7
Std. Dev.	9.6	7	17.3
Median	10	7.5	18
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2	1.2	3
Std. Dev.	1.3	.9	1.8
Median	2	1	4
Percent	-	-	-
Number in Sample	9		

PMRC RFP Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	27	14.5	43
Std. Dev.	9.5	6.7	13.3
Median	24	14	44
Percent	-	-	-
Number in Sample	8		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	2.6	1.3	5.1
Std. Dev.	1.8	1.2	3.8
Median	2	1	5
Percent	-	-	-
Number in Sample	9		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.8	.3	1.6
Std. Dev.	.5	.3	.9
Median	.8	.3	1.5
Percent	-	-	-
Number in Sample	9		

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	5.6	3.6	8.2
Std. Dev.	3.6	2.3	5.1
Median	5	4	8
Percent	-	-	-
Number in Sample	9		

Step 14	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	3	1.8	6.3
Std. Dev.	1.8	1.1	5.6
Median	3	1	5
Percent	-	-	-
Number in Sample	9		

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	7.9	5.6	11.6
Std. Dev.	5.1	4.4	8.3
Median	8	4	12
Percent	-	-	-
Number in Sample	9		

Step 16	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.1	1.3	3.4
Std. Dev.	1.5	1.1	2.5
Median	2	1	3
Percent	-	-	-
Number in Sample	9		

PMRC K Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	29	15	46.5
Std. Dev.	10.4	6.7	17.4
Median	24	16	44
Percent	-	-	-
Number in Sample	8		

Step 23	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.8	1.3	5.6
Std. Dev.	2.3	1.2	4.8
Median	2	1	5
Percent	-	-	-
Number in Sample	9		

Step 24	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.5	1.5
Std. Dev.	.6	.3	1.2
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	9		

Step 25	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.5	1.6
Std. Dev.	.6	.3	1.2
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	9		

NETWORK S6

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	15	9.3	25.4
Std. Dev.	15.4	10.6	25.1
Median	12	5	20
Percent	-	-	-
Number in Sample	7		

Buyers' STEPS

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5	2.5	10.1
Std. Dev.	8.6	4.3	17.1
Median	1	.5	3
Percent	-	-	-
Number in Sample	7		

Solicitation Time	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	154.3	104	264
Std. Dev.	38.9	41.8	71.9
Median	176	112	264
Percent	-	-	-
Number in Sample	7		

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	7.6	5.1	15
Std. Dev.	4.9	4.2	12.5
Median	6	4	12
Percent	-	-	-
Number in Sample	7		

Step 14	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	8.3	5.6	13
Std. Dev.	6.3	5	10.5
Median	6	4	9
Percent	-	-	-
Number in Sample	7		

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	8.3	5.6	13
Std. Dev.	6.3	5	10.5
Median	6	4	9
Percent	-	-	-
Number in Sample	7		

Step 16	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.3	1.9	6.1
Std. Dev.	3.9	2.7	7.9
Median	2	1	3.5
Percent	-	-	-
Number in Sample	7		

Out for KR Sign	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	86.7	41.3	165.3
Std. Dev.	12.8	7.9	44.6
Median	80	40	168
Percent	-	-	-
Number in Sample	7		

Step 25	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.5	.6	2.9
Std. Dev.	1	.4	1.6
Median	1.5	.5	3
Percent	-	-	-
Number in Sample	7		

NETWORK S7

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	16.6	11.4	27.4
Std. Dev.	15.5	10.9	25.2
Median	12	8	20
Percent	-	-	-
Number in Sample	7		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	5.9	3	10.9
Std. Dev.	8.2	4.1	16.6
Median	3	2	5
Percent	-	-	-
Number in Sample	7		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	8.8	4.4	16.7
Std. Dev.	8.1	4	16
Median	5	2	8
Percent	-	-	-
Number in Sample	7		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.9	.4	1.7
Std. Dev.	.6	.3	1.1
Median	1	.3	1.5
Percent	-	-	-
Number in Sample	7		

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	7.9	3.8	11.8
Std. Dev.	5.9	2.5	8.2
Median	8	4	12
Percent	-	-	-
Number in Sample	7		
Step 16	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.6	2.3
Std. Dev.	.4	.3	.9
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		
Step 17	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	8.8	5.5	17
Std. Dev.	17.4	11.7	28.2
Median	2	1	8
Percent	-	-	-
Number in Sample	7		
Step 18	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	7.5	5.1	12.1
Std. Dev.	4.9	4.1	7.7
Median	8	6	12
Percent	-	-	-
Number in Sample	7		
Step 19	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2	1.2	3.9
Std. Dev.	1.2	1	2.3
Median	2	1	4
Percent	-	-	-
Number in Sample	7		
Step 28	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.2	1.6	5.2
Std. Dev.	5.7	2.9	8.4
Median	1	.3	2
Percent	-	-	-
Number in Sample	7		

Step 29	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.1	1	3.8
Std. Dev.	2.7	1.4	3.8
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		

NETWORK S8

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	18.9	12.1	31.3
Std. Dev.	15.3	10.4	24.3
Median	15	8	25
Percent	-	-	-
Number in Sample	7		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.6	.9	2.7
Std. Dev.	.7	.6	1
Median	1.5	1	2
Percent	-	-	-
Number in Sample	7		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	15.1	10	26.7
Std. Dev.	12	6.9	24.7
Median	12	8	24
Percent	-	-	-
Number in Sample	7		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.6	1.5	5.2
Std. Dev.	1.9	1.3	5
Median	2	1	4
Percent	-	-	-
Number in Sample	7		

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	.9	3.9
Std. Dev.	1.3	.8	2.5
Median	1.5	.5	3
Percent	-	-	-
Number in Sample	7		

ASD/PMC RFP Review Normal Optimistic Pessimistic

Mean	27.4	14.3	58.3
Std. Dev.	10.2	5.6	21.5
Median	24	16	56
Percent	-	-	-
Number in Sample	7		

Step 14 Normal Optimistic Pessimistic

Mean	1.6	.9	2.8
Std. Dev.	1.6	1	2.3
Median	1	.5	3
Percent	-	-	-
Number in Sample	7		

Step 15 Normal Optimistic Pessimistic

Mean	5.2	2.9	11.1
Std. Dev.	3.6	2.5	10.2
Median	4.0	2	8
Percent	-	-	-
Number in Sample	7		

Step 16 Normal Optimistic Pessimistic

Mean	.9	.5	1.9
Std. Dev.	.5	.3	1.2
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	7		

Step 19 Normal Optimistic Pessimistic

Mean	7.6	4.3	11.7
Std. Dev.	4.9	2.8	7
Median	8	5	12
Percent	-	-	-
Number in Sample	7		

Step 20 Normal Optimistic Pessimistic

Mean	1.9	1.1	3.3
Std. Dev.	1.4	.9	1.8
Median	1.5	1	3
Percent	-	-	-
Number in Sample	7		

Buyers' STEPS

Step 21	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	9.1	4	18.4
Std. Dev.	8.8	3.4	16.7
Median	8	4	15
Percent	-	-	-
Number in Sample	7		

Step 22	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	9.9	6.3	15.2
Std. Dev.	6.7	5.1	9.9
Median	9	6	16
Percent	-	-	-
Number in Sample	7		

Step 23	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.1	1.5	5.3
Std. Dev.	2.8	1.4	5.2
Median	2	1	3
Percent	-	-	-
Number in Sample	7		

ASD/PMC K Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	29.7	14.3	59.4
Std. Dev.	8.9	7.3	20
Median	32	12	56
Percent	46	16	38
Number in Sample	7		

Step 32	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.1	1.8	5.6
Std. Dev.	3.4	2.3	5.9
Median	1.5	.8	3
Percent	54	23	23
Number in Sample	7		

Step 33	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.5	2
Std. Dev.	.9	.5	1.6
Median	.5	.3	1
Percent	54	18	28
Number in Sample	7		

Buyers' STEPS

Step 34	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.3	1.6	5.4
Std. Dev.	5.7	2.9	8.4
Median	.7	.5	2
Percent	-	-	-
Number in Sample	7		

Step 35	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.1	1.4	5.7
Std. Dev.	2.8	1.6	5.5
Median	3	.5	4
Percent	-	-	-
Number in Sample	7		

NETWORK M2

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.3	3.6	10.8
Std. Dev.	5.7	3.9	10.3
Median	4	2	8
Percent	55	19	26
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.7	1.8
Std. Dev.	1.1	.6	1.6
Median	1	.5	1
Percent	54	22	24
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.5	3	9.1
Std. Dev.	4.2	3.5	11.7
Median	3	2	6
Percent	49	19	32
Number in Sample	9		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.7	1.7	5.9
Std. Dev.	3.5	2.4	7
Median	1.5	1	4
Percent	51	20	29
Number in Sample	9		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.1	2.9	6.8
Std. Dev.	3	2.5	5.7
Median	3	2	5
Percent	51	21	28
Number in Sample	9		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.7	2.1
Std. Dev.	.9	.6	1.2
Median	1	.5	2
Percent	56	21	23
Number in Sample	9		

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.4	1.3
Std. Dev.	.5	.3	.9
Median	1	.5	1.3
Percent	54	22	24
Number in Sample	9		

NETWORK M3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	7.6	4.5	12
Std. Dev.	7.5	4.9	12.3
Median	6	3	8
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.8	2
Std. Dev.	1.1	.5	1.7
Median	1	.5	1
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.5	3.2	10.1
Std. Dev.	7	4.8	14.3
Median	3	2	6
Percent	-	-	-
Number in Sample	9		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.5	2.3	7.4
Std. Dev.	5.5	3.7	10.9
Median	2	1	4
Percent	-	-	-
Number in Sample	9		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.4	3.3	7.2
Std. Dev.	3.5	3	7
Median	3	2	5
Percent	-	-	-
Number in Sample	9		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.8	2.6
Std. Dev.	.8	.5	1.7
Median	1.3	.8	3
Percent	-	-	-
Number in Sample	9		

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.5	1
Std. Dev.	.3	.2	.5
Median	.8	.5	1
Percent	-	-	-
Number in Sample	9		

JAG Award Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	27	13.5	43.5
Std. Dev.	9.5	7.1	18.1
Median	24	10	40
Percent	-	-	-
Number in Sample	8		

Buyers' STEPS

Step 16	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.6	2.5
Std. Dev.	.6	.4	2.2
Median	1	.5	2
Percent	-	-	-
Number in Sample	9		
Step 17	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.4	1.6
Std. Dev.	.7	.4	1.3
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	9		
Step 18	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.4	1.6
Std. Dev.	.5	.3	1.2
Median	1	.5	1.3
Percent	-	-	-
Number in Sample	9		

NETWORK M4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	9.1	6.3	13.8
Std. Dev.	9.1	6.3	13.4
Median	4	3	8
Percent	-	-	-
Number in Sample	9		
Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.6	1.7
Std. Dev.	.6	.3	.9
Median	1	.5	1.3
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	7.3	5.2	10.9
Std. Dev.	9.5	7.2	14.1
Median	4	2.5	6
Percent	-	-	-
Number in Sample	9		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.2	2.1	7
Std. Dev.	3.4	2.3	9.6
Median	2	1	3.5
Percent	-	-	-
Number in Sample	9		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.2	3.8	8
Std. Dev.	3.6	3.2	6.7
Median	5	4	6
Percent	-	-	-
Number in Sample	0		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	1.1	2.8
Std. Dev.	1.3	.9	1.9
Median	1.5	.8	3
Percent	-	-	-
Number in Sample	9		

Step 18	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.5	1.6
Std. Dev.	.5	.3	1.2
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	9		

NETWORK M5

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	10.7	7.8	15.7
Std. Dev.	10.7	7	14.8
Median	7	6	8
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.4	.8	2.1
Std. Dev.	.6	.4	1
Median	1.5	.8	3
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	6.9	4.7	10.4
Std. Dev.	5.5	3	8.4
Median	5	4	6
Percent	-	-	-
Number in Sample	9		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	4.8	2.5	7.9
Std. Dev.	7.3	3.6	12.2
Median	2.5	1	3.5
Percent	-	-	-
Number in Sample	9		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	5.8	3.9	8.9
Std. Dev.	4	2.9	6.9
Median	5	4	6
Percent	-	-	-
Number in Sample	9		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.9	1	3.2
Std. Dev.	1.2	.7	2
Median	2	1	3
Percent	-	-	-
Number in Sample	9		

Step 18	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	2.3	1.1	4.5
Std. Dev.	2.3	1.3	4.9
Median	2	0.5	3
Percent	-	-	-
Number in Sample	9		

Buyers' STEPS

Step 19	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.5	1.8
Std. Dev.	.7	.4	1.7
Median	1	.5	1
Percent	-	-	-
Number in Sample	9		

Step 20	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.5	1.4
Std. Dev.	.3	.3	1.1
Median	.8	.5	1
Percent	-	-	-
Number in Sample	9		

NETWORK M6

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.1	2.7	10.3
Std. Dev.	2.2	1.9	7.8
Median	4	2.5	8
Percent	-	-	-
Number in Sample	7		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	1.1	3.4
Std. Dev.	2.8	2.2	5.6
Median	.8	.3	1
Percent	-	-	-
Number in Sample	7		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.3	4.1	13.1
Std. Dev.	5.2	4.1	13
Median	6	2.5	12
Percent	-	-	-
Number in Sample	7		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.1	3	11.8
Std. Dev.	11.5	5.7	19.7
Median	2	1	4
Percent	-	-	-
Number in Sample	7		
Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.3	4.3	10.8
Std. Dev.	4.2	3.1	8
Median	6	4	10
Percent	-	-	-
Number in Sample	7		
Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.7	1.4	5.3
Std. Dev.	2.5	1.2	5
Median	2	1	4
Percent	-	-	-
Number in Sample	7		
Step 20	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.5	2.1
Std. Dev.	.6	.3	1.2
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		

NETWORK M7

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5	3.1	13.1
Std. Dev.	2.2	1.9	12.8
Median	5	3	8
Percent	-	-	-
Number in Sample	7		
Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	1.1	3.2
Std. Dev.	2.8	2.2	5.7
Median	.5	.3	1
Percent	-	-	-
Number in Sample	7		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	7.5	3.4	12.9
Std. Dev.	7.8	2	13.2
Median	6	4	8
Percent	-	-	-
Number in Sample	7		
Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.6	2.2
Std. Dev.	.4	.2	.8
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		
Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.7	3.2	12
Std. Dev.	8.3	3	13.9
Median	4	3	6
Percent	-	-	-
Number in Sample	7		
Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	5.9	3.3	8.9
Std. Dev.	5.1	2.7	7.5
Median	6	4	8
Percent	-	-	-
Number in Sample	7		
Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.9	1.2	3.7
Std. Dev.	1.1	.9	2.3
Median	2	1	4
Percent	-	-	-
Number in Sample	7		
Step 21	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.6	1.7	4.8
Std. Dev.	2.9	2.1	5.4
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		

Buyers' STEPS

Step 22	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.2	1.5	5.3
Std. Dev.	5.7	2.9	8.4
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		

NETWORK M8

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	9	4.3	16.6
Std. Dev.	5.4	2.4	12.2
Median	8	4	14
Percent	-	-	-
Number in Sample	7		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.6	2.3
Std. Dev.	.4	.2	.8
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.3	2	5.6
Std. Dev.	2.7	2.1	5
Median	2	1	4
Percent	-	-	-
Number in Sample	7		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.7	2.6
Std. Dev.	.6	.4	1.3
Median	1	.7	3
Percent	-	-	-
Number in Sample	7		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.4	4	9.9
Std. Dev.	5.1	3.8	7.5
Median	5	3	6
Percent	-	-	-
Number in Sample	7		

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.6	2.4
Std. Dev.	.5	.2	.8
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		

Step 14	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	7.4	3.7	14.4
Std. Dev.	8.1	3.1	13.9
Median	8	4	12
Percent	-	-	-
Number in Sample	7		

Step 15	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	7.3	4.8	12.5
Std. Dev.	4.5	3.4	7.8
Median	8	6	14
Percent	-	-	-
Number in Sample	7		

Step 16	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.5	1.4	4.4
Std. Dev.	1.1	.6	2.3
Median	3	1.5	4
Percent	-	-	-
Number in Sample	7		

ASD/PMC K Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	28.6	14.9	61.7
Std. Dev.	9.1	5.5	23.4
Median	24	16	56
Percent	-	-	-
Number in Sample	7		

Step 25	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.1	1.4	3.7
Std. Dev.	2.7	2.1	3.3
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		
Step 26	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.4	2
Std. Dev.	.8	.4	1.6
Median	.5	.3	1
Percent	-	-	-
Number in Sample	7		
Step 27	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3	1.7	5.5
Std. Dev.	3.1	2.1	5.5
Median	2	1	3
Percent	-	-	-
Number in Sample	7		
Step 28	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.4	1.4	4.9
Std. Dev.	2.9	2.1	5.8
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		

NETWORK C9

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	12	7	18.4
Std. Dev.	7.4	5.3	12.3
Median	12	5	20
Percent	55	20	25
Number in Sample	7		
Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4	2.5	7.2
Std. Dev.	3.8	2.7	7.7
Median	2	1	5
Percent	58	15	27
Number in Sample	7		

NETWORK F1

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.3	1.4
Std. Dev.	.3	.1	.9
Median	.5	.3	1
Percent	60	23	17
Number in Sample	7		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.2	.9
Std. Dev.	.3	.1	.6
Median	.5	.3	1
Percent	53	22	25
Number in Sample	7		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.4	1.9
Std. Dev.	1.8	.7	2.8
Median	.25	.25	1
Percent	57	14	29
Number in Sample	7		

PMRC Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	13.4	6	29
Std. Dev.	4.7	2.8	14.6
Median	16	8	40
Percent	54	16	30
Number in Sample	7		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.3	1.3
Std. Dev.	.6	.3	1.2
Median	.5	.3	1
Percent	55	23	22
Number in Sample			

NETWORK F2

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	9.8	7.2	13.1
Std. Dev.	10.5	7.9	12.9
Median	6	4.5	8
Percent	50	21	29
Number in Sample	7		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.5	1	2.1
Std. Dev.	1.2	.9	1.5
Median	1	.5	2
Percent	53	29	18
Number in Sample	7		

Solicitation	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	180	148	237.3
Std. Dev.	9.8	27.6	35.7
Median	176	152	252
Percent	50	27	23
Number in Sample	7		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.6	1	2.5
Std. Dev.	1.2	.9	1.6
Median	1	.5	2
Percent	53	24	23
Number in Sample	7		

Tech. Eval.	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	137.7	94	227.7
Std. Dev.	83.6	47.6	89.4
Median	100	80	195
Percent	50	18	32
Number in Sample	6		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.9	2.4	5.7
Std. Dev.	1.8	1.3	2.4
Median	4	2	6
Percent	50	25	25
Number in Sample	7		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.9	4.6	11
Std. Dev.	5	3.6	9.1
Median	6	4	8
Percent	49	28	23
Number in Sample	7		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.9	1.5	4.9
Std. Dev.	2.5	1	5.1
Median	2	1	3
Percent	54	19	27
Number in Sample	7		

BAFO Time	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	66.7	50	96
Std. Dev.	10.6	16.7	19.6
Median	62	40	88
Percent	48	18	34
Number in Sample	7		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	11.5	5.9	15
Std. Dev.	11.9	5.2	15
Median	7	6	8
Percent	47	19	34
Number in Sample	7		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.5	.9	2.4
Std. Dev.	1	.6	1.2
Median	2	1	3
Percent	54	20	26
Number in Sample	7		

JAG K Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	20.5	9.3	38.7
Std. Dev.	10.4	3.3	21.1
Median	16	8	32
Percent	52	17	31
Number in Sample	7		

Buyers' STEPS

Contractor Sign	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	58	28	102.7
Std. Dev.	18.5	14.1	39.3
Median	54	32	80
Percent	59	13	28
Number in Sample	6		

Step 18	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.4	1.1
Std. Dev.	.3	.2	.5
Median	.8	.5	1
Percent	48	28	24
Number in Sample	7		

NETWORK F3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	9.7	6.9	13.8
Std. Dev.	10.4	7.9	12.6
Median	6	4	12
Percent	-	-	-
Number in Sample	7		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.9	2
Std. Dev.	1.2	.9	1.5
Median	1	.5	2
Percent	-	-	-
Number in Sample	7		

Solicitation Time	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	162.7	105.3	216
Std. Dev.	12	19.9	27.2
Median	160	116	220
Percent	-	-	-
Number in Sample	6		

Tech. Eval.	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	108.7	73.3	172
Std. Dev.	40.4	35.6	49.3
Median	108	72	168
Percent	-	-	-
Number in Sample	6		
Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.1	1.3	3.3
Std. Dev.	.7	.6	1.3
Median	2	1	3
Percent	-	-	-
Number in Sample	7		
Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.5	3.1	6.1
Std. Dev.	2.3	2.1	3
Median	4	3	6
Percent	-	-	-
Number in Sample	7		
Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.3	1.4	5.4
Std. Dev.	1.2	.8	5.2
Median	2	1	3
Percent	-	-	-
Number in Sample	7		
Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	7.9	5.1	10.1
Std. Dev.	7.7	5.1	10.4
Median	8	4	8
Percent	-	-	-
Number in Sample	7		
Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.7	2
Std. Dev.	.1	.6	1.4
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	7		

NETWORK F4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	6.2	4.1	9.3
Std. Dev.	8.8	5.9	11.5
Median	3.3	2	4.5
Percent	-	-	-
Number in Sample	6		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.8	1.8
Std. Dev.	1.4	1.1	1.6
Median	.8	.5	1
Percent	-	-	-
Number in Sample	6		

Solicitation	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	136	81.6	204.8
Std. Dev.	37.5	28.5	46.9
Median	144	80	200
Percent	-	-	-
Number in Sample	5		

Tech. Eval.	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	103.2	75.2	182.4
Std. Dev.	46.2	30.4	47.1
Median	80	80	176
Percent	-	-	-
Number in Sample	5		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.7	2.5
Std. Dev.	.5	.2	.8
Median	1.3	.6	3
Percent	-	-	-
Number in Sample	6		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.8	1.8	4.5
Std. Dev.	1.3	1	2.1
Median	3	1.5	4.5
Percent	-	-	-
Number in Sample	6		

Buyers' STEPS

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	1.1	3.8
Std. Dev.	1.1	.9	2.5
Median	1.5	.9	3
Percent	-	-	-
Number in Sample	6		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.3	2.2	4.8
Std. Dev.	2.5	2	3.9
Median	2.3	1.3	3.5
Percent	-	-	-
Number in Sample	6		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.4	1.2
Std. Dev.	.2	.2	.5
Median	.8	.4	1.3
Percent	-	-	-
Number in Sample	6		

NETWORK M0

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.4	1.8
Std. Dev.	.6	.3	1.1
Median	1	.5	2
Percent	58	14	28
Number in Sample	7		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.2	1
Std. Dev.	.3	.2	1.3
Median	.3	.1	.5
Percent	58	16	26
Number in Sample	7		

Lab Review	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	50	24	109.3
Std. Dev.	28.8	18.2	52.3
Median	48	28	100
Percent	54	13	33
Number in Sample	6		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	.7	2.9
Std. Dev.	2	.9	3.2
Median	.5	.3	1
Percent	58	16	26
Number in Sample	7		

Contractor Sign	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	80	43.3	138.7
Std. Dev.	0	8.2	28.9
Median	80	40	120
Percent	59	15	26
Number in Sample	6		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.3	1.3
Std. Dev.	.4	.2	.8
Median	.5	.3	1
Percent	60	20	20
Number in Sample	7		

NETWORK A1

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.8	2.6
Std. Dev.	.9	.6	1.5
Median	1	.5	2.5
Percent	62	22	16
Number in Sample	7		

Buyers' STEPS

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.2	1.3
Std. Dev.	.4	.2	1.3
Median	.3	.1	1.0
Percent	63	19	18
Number in Sample	7		

OTHER DUTIES AS ASSIGNED = 32% or 2.55 hours/day

APPENDIX J
PCO QUESTIONNAIRE

C2 COMPETITIVE BUY \$ 10,000 to \$ 100,000

PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP)

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections and sign RFP

to clerk, repro, contractor, buyer

STEP 4: Pre-negotiation review

Sign technically unacceptable letters (if any)

Review single source determination (if any)

Review buyer's negotiation position / advise

Sign BAFO request letters

buyer negotiates, writes award, clerk types

STEP 5: Review Contract

Review contract

Review file

Send back for corrections

Buyer corrects

STEP 6: Review corrections, sign file

to contractor, buyer, clerk

STEP 7: Sign Contract

Sign Contract

Sign Sorry letters

Sign form letters (12,13,87)

C3 COMPETITIVE BUY \$ 100,000 to \$ 250,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP)

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections and sign RFP

to clerk, repro, contractor, buyer

STEP 4: Pre-negotiation review

Sign technically unacceptable letters (if any)

Review single source determination (if any)

Review buyer's negotiation position / advise

Sign BAFO request letters

buyer negotiates, writes award, clerk types

STEP 5: Review Contract

Review contract

Review file

Send back for corrections

Buyer corrects

STEP 6: Review corrections, sign file

to JAG

STEP 7: Review JAG corrections, sign

to contractor, buyer, clerk

STEP 8: Sign Contract

Sign Contract

Sign Sorry letters

Sign form letters (12,13,87)

C4 COMPETITIVE BUY \$ 250,000 to \$ 500,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP)

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections, sign JAG sheet

to JAG

STEP 4: Review corrections (JAG) and sign RFP

to clerk, repro, contractor, buyer

STEP 5: Pre-negotiation review

Sign technically unacceptable letters (if any)

Review single source determination (if any)

Review buyer's negotiation position / advise

Sign BAFO request letters

buyer negotiates, writes award, clerk types

STEP 6: Review Contract

Review contract

Review file

Send back for corrections

Buyer corrects

STEP 7: Review corrections, sign file

to JAG

STEP 8: Review JAG corrections, sign

to contractor, buyer, clerk

STEP 9: Sign Contract

Sign Contract

Sign Sorry letters

Sign form letters (12,13,87)

C5 COMPETITIVE BUY \$ 500,000 to \$ 750,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP)

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections, sign file

to JAG

STEP 4: Review corrections (JAG), sign file

to PMRC

STEP 5: Review corrections (PMRC), sign RFP

to clerk, repro, offerors ask for RFP Amd.

STEP 6: Sign RFP Amendment

to offerors, buyer, lab, buyer

STEP 7: Pre-negotiation review

Sign technically unacceptable letters (if any)

Review single source determination (if any)

Review buyer's negotiation position / advise

Sign BAFO request letters

buyer negotiates, writes award, clerk types

STEP 8: Review Contract

Review contract

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 9: Review corrections, sign file

to JAG

STEP 10: Review JAG corrections, sign file

to PMRC

STEP 11: Review PMRC corrections, send out-for-signature

to contractor, buyer, clerk

STEP 12: Sign Contract

Sign Contract

Sign Sorry letters

Sign form letters (12,13,87)

C6 COMPETITIVE BUY \$ 750,000 to \$ 1,000,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP with Div. Chief)

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections, sign file

to JAG

STEP 4: Review corrections (JAG), sign file

to PMRC

STEP 5: Review corrections (PMRC), sign RFP

to clerk, repro, offerors ask for RFP Amd.

STEP 6: Sign RFP Amendment

to offerors, buyer, lab, buyer

STEP 7: Pre-negotiation review

Sign technically unacceptable letters (if any)

Review single source determination (if any)

Review buyer's negotiation position / advise

Sign BAFO request letters

buyer negotiates, writes award, clerk types

STEP 8: Review Contract

Review contract

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 9: Review corrections, sign file

to JAG

STEP 10: Review JAG corrections, sign file

to PMRC

STEP 11: Review PMRC corrections, send out-for-signature

to contractor, buyer, clerk

STEP 12: Sign Contract

Sign Contract

Sign Sorry letters

Sign form letters (12,13,87)

C7 COMPETITIVE BUY \$ 1,000,000 to \$ 3,500,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for
discussions with buyer, informal BSP with Div. Chief)

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections, sign file

to JAG

STEP 4: Review corrections (JAG), sign file

to PMRC

STEP 5: Review corrections (PMRC), sign RFP

to clerk, repro, offerors ask for RFP Amd.

STEP 6: Sign RFP Amendment

to offerors, buyer, lab, buyer

STEP 7: Pre-negotiation review

Sign technically unacceptable letters (if any)

Review single source determination (if any)

Review buyer's negotiation position / advise /

Sign BAFO request letters

buyer negotiates, writes award, clerk types

STEP 8: Review Contract

Review contract

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 9: Review corrections, sign file

to JAG

STEP 10: Review JAG corrections, sign file

to PMRC

STEP 11: Review PMRC corrections, send out-for-signature

to contractor, buyer, clerk

STEP 12: Sign Contract

Sign Contract

Help resolve final review problems with PMRC or PMR

Sign Sorry letters

Sign form letters (12,13,87)

C8 COMPETITIVE BUY \$ 3,500,000 to \$10,000,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer)

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections, sign file

to JAG

STEP 4: Review corrections (JAG), sign file

to PMRC

STEP 5: Review corrections (PMRC), sign file

to ASD/PMC

STEP 6: Review corrections (ASD/PMC), sign RFP

to clerk, repro, offerors ask for RFP Amd.

STEP 7: Sign RFP Amendment

to offerors, buyer, lab, buyer

STEP 8: Pre-negotiation review

Sign technically unacceptable letters (if any)

Review single source determination (if any)

Review buyer's negotiation position / advise /

Sign BAFO request letters

buyer holds pre-neg, negotiates, writes award, clerk types

STEP 9: Review Contract

Review contract

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 10: Review corrections, sign file

to JAG

STEP 11: Review JAG corrections, sign file

to PMRC

STEP 12: Review PMRC corrections, sign file

to ASD/PMC

STEP 13: Review ASD/PMC corrections, send out for signature

to contractor, buyer, clerk

STEP 14: Sign Contract

Sign Contract

Help resolve final review problems with PMRC, PMR, PM

Sign Sorry letters

Sign form letters (12,13,87)

S2 SOLE SOURCE BUY \$ 10,000 to \$ 100,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP)

Review and sign Sole Source Justification

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections and sign RFP

to clerk, repro, contractor, buyer

STEP 4: Pre-negotiation review

Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 5: Review Contract

Review contract

Review file

Send back for corrections

Buyer corrects

STEP 6: Review corrections, sign file

to contractor, buyer, clerk

STEP 7: Sign Contract

Sign Contract

Sign form letters (12,13,87)

S3 SOLE SOURCE BUY \$ 100,000 to \$ 250,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP)

Review and sign Sole Source Justification

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections and sign RFP

to clerk, repro, contractor, buyer

STEP 4: Pre-negotiation review

Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 5: Review Contract

Review contract

Review file

Send back for corrections

Buyer corrects

STEP 6: Review corrections, sign file

to JAG

STEP 7: Review JAG corrections, sign

to contractor, buyer, clerk

STEP 8: Sign Contract

Sign Contract

Sign form letters (12,13,87)

S4 SOLE SOURCE BUY \$ 250,000 to \$ 500,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP)

Review and sign Sole Source Justification

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections, sign JAG sheet

to JAG

STEP 4: Review corrections (JAG) and sign RFP

to clerk, repro, contractor, buyer

STEP 5: Pre-negotiation review

Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 6: Review Contract

Review contract

Review file

Send back for corrections

Buyer corrects

STEP 7: Review corrections, sign file

to JAG

STEP 8: Review JAG corrections, sign

to contractor, buyer, clerk

STEP 9: Sign Contract

Sign Contract

Sign form letters (12,13,87)

S5 SOLE SOURCE BUY \$ 500,000 to \$ 750,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP)

Review and Sign Sole Source Justification

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections, sign file

to JAG

STEP 4: Review corrections (JAG), sign file

to PMRC

STEP 5: Review corrections (PMRC), sign RFP

to clerk, repro, offerors

STEP 6: Pre-negotiation review

Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 7: Review Contract

Review contract

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 8: Review corrections, sign file

to JAG

STEP 9: Review JAG corrections, sign file

to PMRC

STEP 10: Review PMRC corrections, send out-for-signature

to contractor, buyer, clerk

STEP 11: Sign Contract

Sign Contract

Sign form letters (12,13,87)

S6 SOLE SOURCE BUY \$ 750,000 to \$ 1,000,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP with Div. Chief)

Review and Sign the Sole Source Justification

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections, sign file

to JAG

STEP 4: Review corrections (JAG), sign file

to PMRC

STEP 5: Review corrections (PMRC), sign RFP

to clerk, repro, offerors

STEP 6: Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 7: Review Contract

Review contract

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 8: Review corrections, sign file

to JAG

STEP 9: Review JAG corrections, sign file

to PMRC

STEP 10: Review PMRC corrections, send out-for-signature

to contractor, buyer, clerk

STEP 11: Sign Contract

Sign Contract

Sign form letters (12,13,87)

S7 SOLE SOURCE BUY \$ 1,000,000 to \$ 3,500,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP with Div. Chief)

Review and Sign Sole Source Justification

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections, sign file

to JAG

STEP 4: Review corrections (JAG), sign file

to PMRC

STEP 5: Review corrections (PMRC), sign RFP

to clerk, repro, offeror ask for RFP Amd.

STEP 6: Sign RFP Amendment

to offeror, buyer, lab, buyer

STEP 7: Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 8: Review Contract

Review contract

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 9: Review corrections, sign file

to JAG

STEP 10: Review JAG corrections, sign file

to PMRC

STEP 11: Review PMRC corrections, send out-for-signature

to contractor, buyer, clerk

STEP 12: Sign Contract

Sign Contract

Help resolve final review problems with PMRC or PMR

Sign form letters (12,13,87)

S8 SOLE SOURCE BUY \$ 3,500,000 to \$10,000,000 PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer)

Review and Sign Sole Source Justification

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections, sign file

to JAG

STEP 4: Review corrections (JAG), sign file

to PMRC

STEP 5: Review corrections (PMRC), sign file

to ASD/PMC

STEP 6: Review corrections (ASD/PMC), sign RFP

to clerk, repro, offeror ask for RFP Amd.

STEP 7: Sign RFP Amendment

to offeror, buyer, lab, buyer

STEP 8: Review buyer's negotiation position / advise /

buyer holds pre-neg, negotiates, writes award, clerk types

STEP 9: Review Contract

Review contract

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 10: Review corrections, sign file

to JAG

STEP 11: Review JAG corrections, sign file

to PMRC

STEP 12: Review PMRC corrections, sign file

to ASD/PMC

STEP 13: Review ASD/PMC corrections, send out for signature

to contractor, buyer, clerk

STEP 14: Sign Contract

Sign Contract

Help resolve final review problems with PMRC, PMR, PM

Sign form letters (12,13,87)

M2 CONTRACT MOD \$ 10,000 to \$ 100,000 PCO Steps

receive letter for review

STEP 1: Review letter to contractor for proposal

Send back for corrections

to buyer, clerk, buyer

STEP 2: Review corrections and sign letter

to clerk, repro, contractor, buyer

STEP 3: Pre-negotiation review

Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 4: Review Contract Modification

Review contract modification

Review file

Send back for corrections

Buyer corrects

STEP 5: Review corrections, sign file

to contractor, buyer, clerk

STEP 6: Sign Contract

M3 MODIFICATION \$ 100,000 to \$ 250,000 PCO Steps

receive typed letter for review

STEP 1: Review letter to contractor for proposal

Send back for corrections

to buyer, clerk, buyer

STEP 2: Review corrections and sign letter

to clerk, repro, contractor, buyer

STEP 3: Pre-negotiation review

Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 4: Review Modification

Review Modification

Review file

Send back for corrections

Buyer corrects

STEP 5: Review corrections, sign file

to JAG

STEP 6: Review JAG corrections, sign

to contractor, buyer, clerk

STEP 7: Sign Modification

M4 MODIFICATION \$ 250,000 to \$ 500,000

PCO Steps

receive typed Letter for review

STEP 1: Review letter to contractor for proposal

Send back for corrections

to buyer, clerk, buyer

STEP 2: Review corrections, sign letter

to clerk, repro, contractor, buyer

STEP 3: Pre-negotiation review

Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 4: Review Modification

Review Modification

Review file

Send back for corrections

Buyer corrects

STEP 5: Review corrections, sign file

to JAG

STEP 6: Review JAG corrections, sign

to contractor, buyer, clerk

STEP 7: Sign Modification

M5 MODIFICATION \$ 500,000 to \$ 750,000 PCO Steps

receive typed letter for review

STEP 1: Review letter to contractor for proposal

Send back for corrections

to buyer, clerk, buyer

STEP 2: Review corrections, sign letter

to contractor

STEP 3: Pre-negotiation review

Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 4: Review Modification

Review Modification

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 5: Review corrections, sign file

to JAG

STEP 6: Review JAG corrections, sign file

to PMRC

STEP 7: Review PMRC corrections, send out-for-signature

to contractor, buyer, clerk

STEP 8: Sign Modification

M6 MODIFICATION \$ 750,000 to \$ 1,000,000 PCO Steps

receive typed letter for review

STEP 1: Review letter to contractor for proposal

Send back for corrections

to buyer, clerk, buyer

STEP 2: Review corrections, sign letter

to contractor

STEP 3: Pre-negotiation review

Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 4: Review Modification

Review Modification

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 5: Review corrections, sign file

to JAG

STEP 6: Review JAG corrections, sign file

to PMRC

STEP 7: Review PMRC corrections, send out-for-signature

to contractor, buyer, clerk

STEP 8: Sign Modification

M7 MODIFICATION \$ 1,000,000 to \$ 3,500,000

PCO Steps

receive typed Letter for review

STEP 1: Review letter to contractor for proposal on changes.

Send back for corrections

to buyer, clerk, buyer

STEP 2: Review corrections, sign letter

STEP 3: Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 4: Review Modification

Review Modification

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 5: Review corrections, sign file

to JAG

STEP 6: Review JAG corrections, sign file

to PMRC

STEP 7: Review PMRC corrections, send out-for-signature

to contractor, buyer, clerk

STEP 8: Sign Modification

Help resolve final review problems with PMRC or PMR

M8 MODIFICATION \$ 3,500,000 to \$10,000,000

PCO Steps

receive typed RFP letter for review

STEP 1: Review RFP

Review RFP letter

Review BSP Minutes

Send back for corrections

to buyer, clerk, buyer

STEP 2: Review corrections, sign file

to PMRC

STEP 3: Review corrections (PMRC), sign BSP Minutes

to ASD/PMC

STEP 4: Review buyer's negotiation position / advise /

buyer holds pre-neg, negotiates, writes award, clerk types

STEP 5: Review Contract Modification

Review contract modification

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 6: Review corrections, sign file

to JAG

STEP 7: Review JAG corrections, sign file

to PMRC

STEP 8: Review PMRC corrections, sign file

to ASD/PMC

STEP 9: Review ASD/PMC corrections, send out for signature

to contractor, buyer, clerk

STEP 10: Sign Contract Modification

Sign Contract Modification

Help resolve final review problems with PMRC, PMR, PM

buyer negotiates, writes award, clerk types

STEP 1: Review Contract

Review contract

Review file

Review and sign Subcontracting Plan

Send back for corrections

Buyer corrects

STEP 2: Review corrections, sign file

to JAG

STEP 3: Review JAG corrections, sign file

to PMRC

STEP 4: Review PMRC corrections, send out-for-signature

to contractor, buyer, clerk

STEP 5: Sign Contract

Sign Contract

Help resolve final review problems with PMRC or PMR

Sign Sorry letters

Sign form letters (12,13,87)

FI FUNDING

PCO's STEPS

receive typed funding

STEP 1: Review typed funding, sign FI 66.

to PMRC, clerk, buyer

STEP 2: Sign funding.

STEP 1: Review type change, sign FI 53, sign letter to contractor.

STEP 2: Sign contract Modification

F2 COMPETITIVE BUY FAST TRACK

PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP)

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections and sign RFP

to clerk, repro, contractor, buyer

STEP 4: Pre-negotiation review

Sign technically unacceptable letters (if any)

Review single source determination (if any)

Review buyer's negotiation position / advise

Sign BAFO request letters

buyer negotiates, writes award, clerk types

STEP 5: Review Contract

Review contract

Review file

Send back for corrections

Buyer corrects

STEP 6: Review corrections, sign file

to JAG

STEP 7: Review JAG corrections, sign

to contractor, buyer, clerk

STEP 8: Sign Contract

Sign Contract

Sign Sorry letters

Sign form letters (12,13,87)

F3 SOLE SOURCE BUY FAST TRACK

PCO Steps

STEP 1: Review PR before Buyer receives it (include time for discussions with buyer, informal BSP)

Review and sign Sole Source Justification

receive typed RFP for review

STEP 2: Review RFP

Review RFP

Review File and sign

Send back for corrections

to buyer, clerk, buyer

STEP 3: Review corrections and sign RFP

to clerk, repro, contractor, buyer

STEP 4: Pre-negotiation review

Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 5: Review Contract

Review contract

Review file

Send back for corrections

Buyer corrects

STEP 6: Review corrections, sign file

to JAG

STEP 7: Review JAG corrections, sign

to contractor, buyer, clerk

STEP 8: Sign Contract

Sign Contract

Sign form letters (12,13,87)

receive typed letter for review

STEP 1: Review letter to contractor for proposal

Send back for corrections

to buyer, clerk, buyer

STEP 2: Review corrections and sign letter

to clerk, repro, contractor, buyer

STEP 3: Pre-negotiation review

Review buyer's negotiation position / advise

buyer negotiates, writes award, clerk types

STEP 4: Review Modification

Review Modification

Review file

Send back for corrections

Buyer corrects

STEP 5: Review corrections, sign file

to JAG

STEP 6: Review JAG corrections, sign

to contractor, buyer, clerk

STEP 7: Sign Modification

A1 ADMINISTRATIVE CHANGE

PCO'S STEP

Receive typed change from buyer

STEP: Sign Modification

OTHER DUTIES AS ASSIGNED

Write and process D&F's over \$ 5M

Train new buyers

Substitute for Branch Chief

Attend meetings for buyers (buyer's negotiation, BSP, Pre-Neg's, meetings with Lab, etc.)

Review draft PRs

Help gather data for management

Sign correspondence for contract administration functions (transfer of GFP, retention of classified, etc.)

Answer telephone calls for absent buyers

APPENDIX K
ANALYSIS OF PCO ESTIMATES

PCO's STEPS
NETWORK C2

Step	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	1.6
Std. Dev.	.4	.3	2.2
Median	.3	.2	.5
Percent	55	23	22
Number in Sample	9		
Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.7	2.4
Std. Dev.	1.1	.3	2
Median	1	.5	2
Percent	72	12	16
Number in Sample	9		
Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.9
Std. Dev.	.3	.3	.7
Median	.3	.3	.7
Percent	76	11	13
Number in Sample	9		
Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2	.7	2.7
Std. Dev.	3	.5	3.6
Median	.8	.5	1
Percent	70	14	16
Number in Sample	9		
Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.6	.9	2.7
Std. Dev.	1.1	.5	2.2
Median	1.5	1	2
Percent	67	17	16
Number in Sample	9		
Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.2	.9
Std. Dev.	.3	.3	.7
Median	.3	.1	.8
Percent	74	12	14
Number in Sample	9		

PCO's STEPS

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.6
Std. Dev.	.3	.3	.6
Median	.3	.2	.3
Percent	77	13	10
Number in Sample	9		

NETWORK C3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.4	2
Std. Dev.	.6	.6	2.5
Median	.3	.2	.5
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.7	2.5
Std. Dev.	1.2	.5	2
Median	1	.5	2
Percent	-	-	-
Number in Sample	9		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	.7	2.3
Std. Dev.	3.2	.8	3.7
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.6	1	2.9
Std. Dev.	1.2	.6	2.3
Median	1.3	.8	2
Percent	-	-	-
Number in Sample	9		

PCO's STEPS

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.4	.9
Std. Dev.	.6	.7	1.0
Median	.3	.2	.4
Percent	-	-	-
Number in Sample	8		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.6
Std. Dev.	.3	.3	.6
Median	.3	.2	.3
Percent	-	-	-
Number in Sample	9		

Network C4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.4	1.8
Std. Dev.	.9	.6	2.3
Median	.3	.3	.7
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.6	.9	2.6
Std. Dev.	1.4	.8	2.1
Median	1	.8	2
Percent	-	-	-
Number in Sample	9		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.3	1.1
Std. Dev.	.6	.3	.9
Median	.5	.3	.8
Percent	-	-	-
Number in Sample	8		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	2.1	.8	2.8
Std. Dev.	3.3	.7	3.9
Median	.8	.5	1.3
Percent	-	-	-
Number in Sample	8		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.7	1.0	2.9
Std. Dev.	1.2	.7	2.4
Median	1.4	.9	2.3
Percent	-	-	-
Number in Sample	8		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.3	.2	.7
Std. Dev.	.3	.3	.6
Median	.3	.2	.3
Percent	-	-	-
Number in Sample	8		

NETWORK C5

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.6	.5	1.8
Std. Dev.	.6	.6	2.1
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.6	1	2.8
Std. Dev.	1.2	.6	2
Median	1	.8	2.5
Percent	-	-	-
Number in Sample	9		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.8	.4	1.7
Std. Dev.	.5	.3	1.2
Median	.5	.3	1.5
Percent	-	-	-
Number in Sample	9		

PCO's STEPS

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.7
Std. Dev.	.3	.3	.6
Median	.3	.2	.5
Percent	-	-	-
Number in Sample	9		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.2	.9	3
Std. Dev.	3.1	.7	3.6
Median	1	.8	2
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	1.1	3.2
Std. Dev.	1.1	.6	2.3
Median	1.5	1.0	3
Percent	-	-	-
Number in Sample	9		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.4	1.7
Std. Dev.	.9	.6	1.7
Median	.5	.3	.8
Percent	-	-	-
Number in Sample	9		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.2	1.1
Std. Dev.	.7	.3	1
Median	.3	.2	3.0
Percent	-	-	-
Number in Sample	9		

PCO's STEPS

NETWORK C6

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.5	1.9
Std. Dev.	.8	.6	2.2
Median	.7	.5	1
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.9	1.1	3.1
Std. Dev.	1.2	.6	2
Median	1.3	.8	2.5
Percent	-	-	-
Number in Sample	9		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.4	1	3.6
Std. Dev.	3	.7	3.9
Median	1.5	.8	2
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.9	1.2	3.3
Std. Dev.	1.2	.6	2.4
Median	1.5	1	2
Percent	-	-	-
Number in Sample	9		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.3	1.2
Std. Dev.	.6	.3	1.1
Median	.3	.2	.3
Percent	-	-	-
Number in Sample	9		

PCO' STEPS

NETWORK C7

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.6	1	3
Std. Dev.	1.4	.8	3
Median	1	.8	1.5
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.6	1.7	4.3
Std. Dev.	1.5	.9	2.6
Median	2	1.5	4
Percent	-	-	-
Number in Sample	9		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.2	1.6	4.4
Std. Dev.	3.7	1.2	4.8
Median	1.5	1	2
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.3	1.5	4
Std. Dev.	1	.5	2.5
Median	2	1.5	4
Percent	-	-	-
Number in Sample	8		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.6	1.9
Std. Dev.	.9	.6	1.6
Median	.8	.5	2
Percent	-	-	-
Number in Sample	9		

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Q-GERT MODEL OF THE CONTRACTING CYCLE(U) AIR FORCE INST 8/8
OF TECH WRIGHT-PATTERSON AFB OH SCHOOL OF SYSTEMS AND
LOGISTICS C D MILLER SEP 83 AFIT-LSSR-118-83

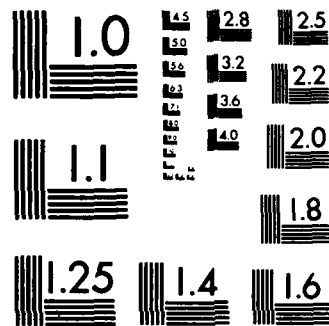
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

NETWORK C8

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.1	1.9	5.7
Std. Dev.	3.6	1.9	7.5
Median	1.5	1	2
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.3	2.5	5.1
Std. Dev.	1.7	1.3	2.6
Median	3	2	6
Percent	-	-	-
Number in Sample	9		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.9	2.8
Std. Dev.	.8	.5	2.3
Median	1	.8	2
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4.1	2.3	6.5
Std. Dev.	5	2.5	8.1
Median	2	1	2.5
Percent	-	-	-
Number in Sample	9		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.1	2.2	5.4
Std. Dev.	1.5	1.1	3.5
Median	3	2	5
Percent	-	-	-
Number in Sample	9		

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.8	2.8
Std. Dev.	.9	.6	2.5
Median	.9	.5	1.8
Percent	-	-	-
Number in Sample	8		

Step 14	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	1.1	3.1
Std. Dev.	1.2	.7	2.3
Median	2	1	3
Percent	-	-	-
Number in Sample	9		

NETWORK S2

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.5	1.8
Std. Dev.	.9	.6	2.5
Median	.5	.25	.8
Percent	70	15	15
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.6	1.8
Std. Dev.	.6	.3	1
Median	1	.5	2
Percent	70	14	16
Number in Sample	9		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.8
Std. Dev.	.2	.3	.5
Median	.3	.3	.7
Percent	71	15	14
Number in Sample	9		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.5	1.6
Std. Dev.	.6	.3	1.3
Median	.8	.4	1.3
Percent	70	13	17
Number in Sample	9		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.8	2.3
Std. Dev.	.8	.5	1.6
Median	1	.5	2
Percent	70	15	15
Number in Sample	9		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.8
Std. Dev.	.3	.3	.5
Median	.3	.3	.8
Percent	70	15	15
Number in Sample	9		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.8
Std. Dev.	.3	.3	.7
Median	.3	.2	.3
Percent	75	16	9
Number in Sample	9		

NETWORK S3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.0	.7	2.1
Std. Dev.	1.0	.8	2.7
Median	.8	.5	1
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.8	2
Std. Dev.	.8	.5	1.1
Median	1	.5	2
Percent	-	-	-
Number in Sample	8		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.7	1.6
Std. Dev.	.8	.6	1.5
Median	.5	.3	.7
Percent	-	-	-
Number in Sample	8		

PCO's STEPS

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.5	1.0	2.4
Std. Dev.	1.0	0.7	1.8
Median	1.1	0.8	1.8
Percent	-	-	-
Number in Sample	8		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.4	.9
Std. Dev.	.6	.6	.8
Median	.3	.2	.8
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.8
Std. Dev.	.3	.3	.6
Median	.3	.2	.5
Percent	-	-	-
Number in Sample	9		

NETWORK S4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.8	2.2
Std. Dev.	1	.6	1.9
Median	.9	.6	1.5
Percent	-	-	-
Number in Sample	8		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.6	.8	2.5
Std. Dev.	1.3	.5	2.1
Median	1	.6	2.1
Percent	-	-	-
Number in Sample	8		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.7	.5	1.5
Std. Dev.	.9	.6	1.5
Median	.5	.3	1
Percent	-	-	-

Number in Sample 9

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.3	.7	2.6
Std. Dev.	.9	.3	2.5
Median	.9	.6	1.5
Percent	-	-	-

Number in Sample 8

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.4	.9	2.6
Std. Dev.	.8	.5	1.7
Median	1.3	.8	2.3
Percent	-	-	-

Number in Sample 8

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.3	.2	.7
Std. Dev.	.3	.3	.6
Median	.3	.2	.4
Percent	-	-	-

Number in Sample 8

NETWORK S5

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.1	.7	1.9
Std. Dev.	1	.6	1.7
Median	.8	.5	1
Percent	-	-	-

Number in Sample 9

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.8	1.0	2.8
Std. Dev.	1.3	.8	2
Median	1	.8	2.5
Percent	-	-	-

Number in Sample 9

PCO's STEPS

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.5	1.6
Std. Dev.	.8	.6	1.4
Median	.8	.3	1.5
Percent	-	-	-
Number in Sample	9		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.8	2
Std. Dev.	1.1	.7	1.9
Median	.8	.5	1
Percent	-	-	-
Number in Sample	9		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	1.2	2.7
Std. Dev.	1.2	.9	2
Median	1.5	1	2
Percent	-	-	-
Number in Sample	9		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.5	1.5
Std. Dev.	.9	.6	1.2
Median	.5	.3	1
Percent	-	-	-
Number in Sample	8		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.9
Std. Dev.	.3	.3	.7
Median	.3	.2	.7
Percent	-	-	-
Number in Sample	9		

PCO's STEPS

NETWORK S6

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.8	2.1
Std. Dev.	1.1	.6	1.7
Median	.8	.5	1
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	1	3
Std. Dev.	1.2	.5	2.1
Median	1.3	.8	2.5
Percent	-	-	-
Number in Sample	9		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.8	2.5
Std. Dev.	1.3	.7	2.4
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	9		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2	1.2	3.3
Std. Dev.	1.1	.5	1.9
Median	1.5	1	3
Percent	-	-	-
Number in Sample	9		

Step 11	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.3	1.1
Std. Dev.	.4	.3	.8
Median	.3	.3	1
Percent	-	-	-
Number in Sample	9		

NETWORK S7

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.4	1.4	4.3
Std. Dev.	2.4	1.2	4.9
Median	1.5	1	2
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.6	1.5	4.5
Std. Dev.	1.6	.8	3.1
Median	2.5	1.5	3.5
Percent	-	-	-
Number in Sample	9		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.4	1.5
Std. Dev.	.6	.3	1.3
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.7	1.6	4.4
Std. Dev.	2.7	1.6	5
Median	1	.8	2
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.8	1.9	4.9
Std. Dev.	2.3	1.4	4.7
Median	2	1.5	2.5
Percent	-	-	-
Number in Sample	9		

Step 12	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.5	.9	2.2
Std. Dev.	1.4	.8	1.9
Median	1.1	.8	1.5
Percent	-	-	-
Number in Sample	8		

NETWORK S8

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	4	2.2	5.8
Std. Dev.	5.3	2.6	7.9
Median	1.3	.9	1.8
Percent	-	-	-
Number in Sample	8		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.1	2.1	5.3
Std. Dev.	2.2	1.6	4.8
Median	2.5	1.8	3.3
Percent	-	-	-
Number in Sample	8		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.7	2.7
Std. Dev.	1.0	.5	2.3
Median	.9	.5	1.3
Percent	-	-	-
Number in Sample	8		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3	1.5	5.4
Std. Dev.	2.8	1.2	5.7
Median	2	1.4	3
Percent	-	-	-
Number in Sample	8		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	3.5	2.1	5.6
Std. Dev.	2.5	1.1	5.1
Median	2.5	1.8	3.3
Percent	-	-	-
Number in Sample	8		

Step 13	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.7	2.3
Std. Dev.	1.1	.5	1.8
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	8		

Step 14	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2	.8	3.7
Std. Dev.	2.6	.8	5.2
Median	1	.5	1.8
Percent	-	-	-
Number in Sample	8		

NETWORK M2

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.4	1.3
Std. Dev.	.4	.3	1.3
Median	.5	.3	.7
Percent	68	15	17
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.9
Std. Dev.	.3	.3	.8
Median	.3	.2	.5
Percent	74	14	12
Number in Sample	9		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.6	1.4
Std. Dev.	.7	.4	1.1
Median	.5	.3	.8
Percent	74	12	14
Number in Sample	9		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.8	1.9
Std. Dev.	.9	.5	1.2
Median	1	.8	2
Percent	70	15	15
Number in Sample	9		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.3	.9
Std. Dev.	.5	.3	.6
Median	.5	.3	1
Percent	70	13	17
Number in Sample	9		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.9
Std. Dev.	.3	.3	1.0
Median	.3	.2	.3
Percent	76	14	10
Number in Sample	9		

NETWORK M3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.4	1.4
Std. Dev.	.6	.3	1
Median	.4	.3	.
Percent	-	-	-
Number in Sample	8		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pe</u>	<u>istic</u>
Mean	.8	.4	1.3	
Std. Dev.	.8	.4	1.2	
Median	.5	.3	.7	
Percent	-	-	-	
Number in Sample	8			

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.7	1.7
Std. Dev.	.6	.3	1.0
Median	1	.6	1.6
Percent	-	-	-
Number in Sample	8		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.3	1.2
Std. Dev.	.6	.3	.9
Median	.4	.2	.9
Percent	-	-	-
Number in Sample	8		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.8
Std. Dev.	.3	.3	.8
Median	.3	.2	.3
Percent	-	-	-
Number in Sample	8		

PCO'S STEPS

NETWORK M4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.4	1.5
Std. Dev.	.6	.3	1.4
Median	.5	.3	.7
Percent	-	-	-
Number in Sample	8		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.5	1.4
Std. Dev.	.7	.3	1.1
Median	.5	.3	.8
Percent	-	-	-
Number in Sample	8		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.8	1.9
Std. Dev.	.9	.6	1.3
Median	1	.6	1.6
Percent	-	-	-
Number in Sample	8		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.8
Std. Dev.	.3	.3	.8
Median	.3	.2	.4
Percent	-	-	-
Number in Sample	8		

NETWORK M5

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.0	.5	1.8
Std. Dev.	1.0	.6	2.0
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.2	.7	1.9
Std. Dev.	1	.5	1.6
Median	.5	.3	.8
Percent	-	-	-
Number in Sample	8		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.5	.9	2.5
Std. Dev.	.8	.5	1.4
Median	1.3	.9	2.5
Percent	-	-	-
Number in Sample	8		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.8	.6	1.5
Std. Dev.	.9	.6	1.3
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.4	.3	.9
Std. Dev.	.3	.3	.7
Median	.3	.2	.5
Percent	-	-	-
Number in Sample	9		

NETWORK M6

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.3	.7	2.2
Std. Dev.	1.0	.6	2.0
Median	.8	.5	1.5
Percent	-	-	-
Number in Sample	8		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	1.4	.7	1.9
Std. Dev.	1.1	.6	1.5
Median	.8	.5	1.3
Percent	-	-	-
Number in Sample	8		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.9	2.6
Std. Dev.	.8	.5	1.6
Median	1	.8	2.1
Percent	-	-	-
Number in Sample	8		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	1.1
Std. Dev.	.3	.3	.8
Median	.3	.2	.8
Percent	-	-	-
Number in Sample	8		

NETWORK M7

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.5	1.0	2.7
Std. Dev.	1.0	.6	2.0
Median	1.0	.8	2
Percent	-	-	-
Number in Sample	9		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.5	.9	2.4
Std. Dev.	1.0	.5	1.4
Median	1	.8	2
Percent	-	-	-
Number in Sample	9		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.7	1.1	3.1
Std. Dev.	1.0	.8	2.4
Median	1.0	0.8	2.0
Percent	-	-	-
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.6	2.4
Std. Dev.	1.0	.6	2.6
Median	.8	.5	1.5
Percent	-	-	-
Number in Sample	9		

NETWORK M8

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.1	1.3	3.3
Std. Dev.	1.4	.9	2.6
Median	1.8	1.1	2.5
Percent	-	-	-
Number in Sample	8		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.6	2
Std. Dev.	.9	.6	1.5
Median	.8	.5	1.3
Percent	-	-	-
Number in Sample	8		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	1.1	3.1
Std. Dev.	1.2	.6	2.4
Median	1.5	1	2
Percent	-	-	-
Number in Sample	8		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.8	1.3	2.9
Std. Dev.	1.0	.7	1.6
Median	1.8	1	2.5
Percent	-	-	-
Number in Sample	8		

Step 9	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.7	1.9
Std. Dev.	.8	.6	1.4
Median	1	.5	1.5
Percent	-	-	-
Number in Sample	8		

Step 10	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.1	.6	2.2
Std. Dev.	1.0	.4	2.6
Median	.8	.5	1.1
Percent	-	-	-
Number in Sample	8		

NETWORK C9

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	2.5	1.4	4.2
Std. Dev.	1.2	.8	2.3
Median	3	1	4
Percent	-	-	-
Number in Sample	9		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.7	3.0
Std. Dev.	1.2	.6	2.7
Median	1.0	.8	2.5
Percent	-	-	-
Number in Sample	9		

NETWORK F1

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.8
Std. Dev.	.2	.3	.9
Median	.3	.2	.5
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.3	.5
Std. Dev.	.3	.3	.6
Median	.2	.1	.3
Percent	-	-	-
Number in Sample	9		

NETWORK M0

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.4	1.5
Std. Dev.	.5	.3	1.7
Median	.5	.3	1.0
Percent	-	-	-
Number in Sample	9		

PCO's STEPS

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.7
Std. Dev.	.3	.3	.7
Median	.3	.1	.3
Percent	70	15	15
Number in Sample	9		

NETWORK F2

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.4	1.2
Std. Dev.	.4	.3	.8
Median	.5	.3	1
Percent	74	11	15
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.7	2
Std. Dev.	.6	.3	1.3
Median	1	.8	2
Percent	72	13	15
Number in Sample	9		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.4	1
Std. Dev.	.3	.3	.7
Median	.5	.3	.7
Percent	77	11	12
Number in Sample	9		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.3	.7	2.1
Std. Dev.	1.1	.5	1.6
Median	1	.5	1.5
Percent	72	12	16
Number in Sample	9		

PCO's STEPS

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.4	.7	2.1
Std. Dev.	.8	.3	1.3
Median	1	.8	1.5
Percent	73	12	15
Number in Sample	9		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.3	1.1
Std. Dev.	.3	.3	.7
Median	.5	.3	.8
Percent	77	10	13
Number in Sample	9		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.3	.9
Std. Dev.	.3	.3	.7
Median	.3	.3	.7
Percent	73	13	14
Number in Sample	9		

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.7
Std. Dev.	.3	.3	.5
Median	.3	.2	.5
Percent	76	13	11
Number in Sample	9		

NETWORK F3

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.7	.4	1.5
Std. Dev.	.6	.4	1.2
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.6	1.7
Std. Dev.	.6	.3	1.3
Median	1	.6	1.4
Percent	-	-	-
Number in Sample	9		
Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.5	1.4
Std. Dev.	.3	.3	.7
Median	.3	.3	.7
Percent	-	-	-
Number in Sample	9		
Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.8	.5	1.4
Std. Dev.	.5	.5	1.1
Median	.5	.3	1
Percent	-	-	-
Number in Sample	9		
Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1.2	.7	1.9
Std. Dev.	.6	.3	1.1
Median	1	.8	1.5
Percent	-	-	-
Number in Sample	9		
Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.5	.3	1
Std. Dev.	.3	.3	.8
Median	.5	.3	.8
Percent	-	-	-
Number in Sample	9		
Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.9
Std. Dev.	.3	.3	.7
Median	.3	.2	.5
Percent	-	-	-
Number in Sample	9		

PCO's STEPS

Step 8	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.4	.3	.7
Std. Dev.	.3	.3	.6
Median	.3	.2	.5
Percent	-	-	-
Number in Sample	9		

NETWORK F4

Step 1	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.6	.3	1.3
Std. Dev.	.3	.1	1.2
Median	.5	.3	.8
Percent	-	-	-
Number in Sample	7		

Step 2	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.2	.7
Std. Dev.	.2	.1	.3
Median	.3	.2	.8
Percent	-	-	-
Number in Sample	7		

Step 3	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.9	.5	1.3
Std. Dev.	.8	.3	1.1
Median	.5	.3	.8
Percent	-	-	-
Number in Sample	7		

Step 4	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	1	.6	1.5
Std. Dev.	.5	.2	.8
Median	1	.5	1.3
Percent	-	-	-
Number in Sample	7		

Step 5	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.4	.2	.6
Std. Dev.	.1	.1	.3
Median	.3	.3	.5
Percent	-	-	-
Number in Sample	7		

Step 6	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.3	.2	.6
Std. Dev.	.1	.1	.3
Median	.3	.3	.5
Percent	-	-	-
Number in Sample	7		

Step 7	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
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Mean	.3	.2	.7
Std. Dev.	.1	.1	.6
Median	.3	.2	.5
Percent	-	-	-
Number in Sample	7		

NETWORK A1

	<u>Normal</u>	<u>Optimistic</u>	<u>Pessimistic</u>
Mean	.3	.3	.3
Std. Dev.	0	0	0
Median	.3	.3	.3
Percent	-	-	-
Number in Sample	9		

Other Duties as Assigned: 42% Sample = 7

APPENDIX L
LIST OF EXPERTS

LIST OF EXPERTS

The following people in the R&D Contracting Directorate helped to define the major activities which compose the steps in the contracting process:

Lawrence Kopa	PCO/Buyer	PMRSA
Lynn A Warner	PCO/Buyer	PMRSA
Judith Lindsey	PCO/Buyer	PMRNA
Rick Benge	PCO/Buyer	PMREB
Michael Szczepanek	PCO/Buyer	PMREA
Todd Eisenhut	PCO/Buyer	PMREC
Mary Ann Sharits	Buyer	PMREA
Cindy Larck	Clerk	PMRNB
Janice George	Clerk	PMREA
Annette Atha	Clerk	PMRRA
James McBride	Division Chief	PMRO
Daniel Schaetzle	Buyer	PMREA
Michael Weaver	PCO/Buyer	PMRNA
Phyllis Jones	Clerk	PMREA
Marion Wood	Clerk	PMRRB

SELECTED BIBLIOGRAPHY

A. REFERENCES CITED

1. Aeronautical Systems Division, Air Force Systems Command. AF Form 1378, Civilian Personnel Position Description: Contract Negotiator, GS-1102-13, Wright-Patterson AFB OH, 16 October 1980.
2. Aeronautical Systems Division, Air Force Systems Command. AF Form 1378, Civilian Personnel Position Description: Contract Specialist, GS-1102-12, Wright-Patterson AFB OH, 12 April 1979.
3. Aeronautical Systems Division, Air Force Systems Command. AF Form 1378, Civilian Personnel Position Description: Procurement Clerk (Typing), GS-1102-5, Wright-Patterson AFB OH, 23 November 1979.
4. Aeronautical Systems Division, Air Force Systems Command. Management Data Book, Wright-Patterson AFB OH, February 1983.
5. Aeronautical Systems Division, Air Force Systems Command. Manpower, Organization and Function Chart Book, Wright-Patterson AFB OH, 2 June 1983.
6. Anderson, David R., Dennis J. Sweeney, and Thomas A. Williams. An Introduction to Management Science. 3d ed. St Paul: West Publishing Company, 1982.
7. Anthony, Robert N., and Regina E. Herzlinger. Management Control in Nonprofit Organizations. Homewood IL: Richard D. Irwin, Inc., 1980.
8. Auffrey, Lawrence A. "Contracting Productivity Measurement System," unpublished research study, Air University, Maxwell AFB AL, 1979.
9. Caruth, Donald L. Planning for Clerical Measurement. New York: American Management Association, Inc., 1970.
10. Department of Defense. Productivity Enhancement, Measurement, and Evaluation - Operating Guidelines and Reporting Instructions. DODI 5010.34. Washington: Government Printing Office, 4 August 1975.
11. Dervitsiotis, Kosta N. Operations Management. New York: McGraw-Hill Book Co., 1981.

12. Glover, Waverly. Chief, Flight Dynamics Branch, Flight Dynamics Division, Directorate of R&D Contracting, Aeronautical Systems Command, Air Force Systems Command. Personal interview. April-August 1983.
13. Kennah, Major Richard B. "The Measurement of Procurement Workload," unpublished masters thesis, GSM/SM/74S-10, AFIT/EN, Wright-Patterson AFB OH, 1974. AD A787213.
14. Lee, Lamar, Jr., and Donald W. Dobler. Purchasing and Materials Management. 3d ed. New York: McGraw-Hill Book Company, 1977.
15. Lovelock, Christopher H. and Robert F. Young. "Look to Consumers to Increase Productivity," Harvard Business Review, May-June 1979, pp. 168-179.
16. McBride, Captain James. Chief, Management Operation Division, Directorate of R&D Contracting, Aeronautical Systems Division, Air Force Systems Command. Personal interview. 19 August 1983.
17. McClave, James T. and P. George Benson. Statistics for Business and Economics. 2d ed. Santa Clara CA: Dellen Publishing Company, 1982.
18. McConnell, Campbell R. "Why is U.S. Productivity Slowing Down," Harvard Business Review, March-April 1979, pp. 36-60.
19. Page, Harry Robert. Public Purchasing and Materials Management. Lexington MA: Lexington Books, 1980.
20. Plowman, Kathy. Procurement Analyst, Contract Review Division, Directorate of R&D Contracting, Aeronautical Systems Division, Air Force Systems Command. Personal interview. 19 August 1983.
21. Poulos, Pete G. "Challenging DoD Managers to Improve Internal Productivity," Defense Management Journal, 13 (April 1977), pp. 34-40.
22. Pritsker, A. Alan B. Modeling and Analysis Using Q-GERT Networks. New York: John Wiley & Sons, 1979.
23. R&D Contracting Directorate, Aeronautical Systems Division, Air Force Systems Command. Operating Instruction 171-2, Automated Data Processing Systems and Procedures: DATA-CEN Documentation. Wright-Patterson AFB OH, 17 March 1982.

24. R&D Contracting Directorate, Aeronautical Systems Division, Air Force Systems Command. Research and Development Contracting Overview. Wright-Patterson AFB OH, 10 November 1982.
25. Rackliff, Kenneth. Procurement Analysis, Management Operations Division, Directorate of R&D Contracting, Aeronautical Systems Division, Air Force Systems Command. Personal interview. April-August 1983.
26. Rastetter, Arthur L., III. "Managerial Activity Analysis via Mintzberg's Role Theory: the Effects of Person and Organization Variables," unpublished doctoral dissertation proposal, School of Management, Florida State University, 1982.
27. Sandman, William E. and John P. Hayes. How to Win Productivity in Manufacturing. Dresher PA: Yellow Books of PA, Inc., 1979.
28. School of Systems and Logistics, Air Force Institute of Technology (ATC). Compendium of Authenticated Systems and Logistics Terms, Definitions and Acronyms. Wright-Patterson AFB OH, 1 April 1981.
29. Shannon, Robert E. System Simulation: the Art and Science. Englewood Cliffs NJ: Prentice-Hall, Inc. 1979.
30. Tuttle, Thomas C., "Productivity Measurement Methods: Classification, Critique, and Implications for the Air Force," unpublished research report, unnumbered, Human Resource Laboratory, Air Force System Command, Brooks AFB TX, 1981.
31. Walter, George. Chief, Development Branch, Avionics Division, Directorate of R&D Contracting, Aeronautical Systems Division, Air Force Systems Command. Personal interview. 22 August 1983.
32. Weiss, Colonel Bernard L., USAF. DCS/Contracting and Manufacturing, Air Force Systems Command. DCS/Contracting and Manufacturing Policy Letter: Implementation of Fast Track Contracting Method and Contract Lead Time Reporting, to ASD/PM. Andrews AFB DC, 15 September 1981.
33. "Where Are the Jobs?" Contract Management. 20 (April 1980), pp. 10-11.

34. White, Dick. Chief, Metals Branch, Materials Division, Directorate of R&D Contracting, Aeronautical Systems Division, Air Force Systems Command. Personal interview. 19 August 1983.
35. Wright, Donald L. and Patrick W. Cummings. "Purchasing Productivity Measurement Systems," unpublished master's thesis. Naval Post-Graduate School, Monterey CA, September 1980.

B. RELATED SOURCES

Heaton, Herbert. Productivity in Service Organizations. New York: McGraw-Hill Book Co., 1977.

Malkiel, Burton G. "Productivity - The Problem Behind the Headlines," Harvard Business Review, May-June 1979, pp. 81-91.

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